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ABSTRACT

This report covers research, development, evaluation, and diffusion in its documentation of the experiences of South Korea's most comprehensive attempt at educational reform: the Primary and Middle School Development Project. An introduction provides background and a survey of Korean educational problems. Chapter II describes the proposed New Educational System (NES) in terms of objectives, school management system, and instructional system and materials. The NES consists of four subsystems relating to instruction, school management, instructional radio and television, and school evaluation. Chapter III describes the development, demonstration, and diffusion of the NES in sections that cover small scale tryouts, comprehensive demonstration, development of teaching and learning materials, diffusion, and teacher training. Chapter IV reports on results of implementation with regard to project evaluation method, and evaluation of intrinsic and payoff goals. Conclusions and prospects are advanced in Chapter V, which concerns the impact of NES on educational broadcasting and policy, new textbooks, classroom instruction, and building of theory related to subject matter instruction. Appendices provide examples of a teacher's guide and student's workbook for fifth-grade social studies and a concise description of the project. (RH)

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Final Report of the Elementary-Middle School Development Project

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Korean Educational Development Institute

Occasional Paper 83-4

Final Report of the Elementary-Middle School Development Project

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Korean Educational Development Institute

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PREFACE

Since the1950s educational reforms have been made on large scales in various places of the world. Irrespective of the development stage of a nation, the existent educational programs are losing relevance in the face of emerging needs. What is common about all educational reforms is that every reform is primarily concerned with new instructional materials and new methodologies. The evershifting frame of reference also attaches importance to the development of humane character.

The 1970s witnessed the so-called Primary and Middle School Development Project, the most comprehensive educational reform that has ever been attempted in Korea. This Project was purported to develop and tryout a new educational system which included the development of instructional model, school management and instructional materials, and improvement of teaching competency, all directed toward a higher quality of education.

The monumental task of developing a new educational system which is viable in the indigenous setting of Korea comes to its and with far-reaching impact on overall aspects of education. With the advent of new curricula, new textbooks and teacher's guide have been produced. Although the name of "new educational system" is gone, the instructional and management theories will stand out as the principles to guide the forthcoming reforms.

The report documents the experiences of this educational reform covering the entire cycle of research, development, evaluation and diffusion. It is hoped that this report will serve as a material to be referred to by those engaged in educational reforms.

Taking this opportunity, I wish to acknowledge the valuable contribution of researchers, teachers, students, supervisors and administrators who have been involved in this project over the period of ten years, in particular Dr. Kim Ho-gwon, Dr. Kim Yung-ho, Dr. Byun Young-kye, Dr. Park Do-soon, Dr. Kim Choong-hoe, Dr. Kim Yoon-tai, Mr. Chang Suk-woo, Dr. Chang Un-hyo, Mr. Lee Dae-gyu, Mr. Han Myun-hee, and Mr. Kim Jai-bok.

Kim Young-shik
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   –Paul H. Masoner –

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I. Introduction

1. Background

The Elementary-Middle School Development Project (E-M Project) represents an ambitious attempt at the national level to introduce a more efficient and higher quality educational program into elementary and middle schools in Korea.

This project is markedly different from the conventional, patchwork type of reform programs observed in the past in the sense that the former is characterized by a full cycle of research-development-demonstration-diffusion activities. Thus, it is more likely to bring forth comprehensive and consistent reform measures, that cut across the entire facet of education. More important, it provides for the solution of various problems, as well as doing away with the inefficiencies of the conventional educational system. Such an intensive and consistant effort in educational reform is considered as the sure road to a more viable and dynamic educational system.

The Korean Educational Development Institute (KEDI) was established to carry out the design development and implementation of the E-M Project. The establishment of KEDI was recommended by the Long-Range Educational Planning Committee in 1970. Pursuant to the Korean government's request, a survey team from Florida State University conducted a systems analysis on Korean education, and came up with the recommendation for developing an alternative system for elementary and middle schools. This recommendation was subsequently followed by the granting of development loan for the establishment of KEDI which would undertake the E-M Project.

The proposals for loan was passed by the National Assembly on July 1972, and the Ministry of Education formally approved the establishment of KEDI as a special juridical body on August 1972. The

KEDI law was inacted on March of 1973.

The E-M Project was the direct motive for the establishment of KEDI. This project was implemented progressively over seven years with ground work having been laid for the project during the preparatory year of 1972. Included in the ground work were the establishment of the institute, staff training, and the development of new educational system model. The period from 1973 to 1976 was devoted to the development and production of instructional/learning materials, partial testing of their effectiveness in classrooms, construction of KEDI's new office building and studios together with its transmission station, and staff development. The period of 1975-1980 envisioned a comprehensive demonstration of the new system model and testing of its effectiveness.

2. Problems in Korean Education

The rapid torrent of change sweeping the contemporary world has exerted profound influence on the environment surrounding education. Population growth has precipitated the emergence of much larger groups of students and teachers. The explosion of knowledge rendered the existent contents and methods of education obsolete and the chaotic value system following the massive influx of alien cultures, brought doubt as to the validity of the educational role, that is simply to transmit traditional values to the succeeding generations. All these new challenges set up an outcry for a dramatic change of educational system, more acutely needed is higher mental processes to develop problem-solving ability, creativity and critical thinking. Increasing importance is attached to continual search for new values, enabling one to be viable in the dynamic society.

In view of the increasing diversification of educational roles, it is not fair to hold the schools alone responsible for education, the erstwhile inertia of educational system has spawned a host of problems,

which delay solution unless simultaneous assaults are launched in all fronts of education.

The salient problems facing Korean education are largely associated with the rapid expansion of the elementary and middle schools, low cost-effectiveness, over-crowded classroom, the paucity of learning resources, labor intensive instructional system, low levels of student achievement, marked regional variation in the quality of education, and the irrelevancy of educational programs to the present and future needs of the nation.

Approximately 300 million dollars, 18 percent of Korea's national budget, have been allocated to the Ministry of Education for the fiscal year 1973, with about 85 percent of it used for primary and secondary education. In spite of the heavy investment at these levels, few individuals have been satisfied with the outcomes of the current educational system. The present educational system leaves much to be desired in terms of its response to new challenges. The purpose of the Elementary-Middle School Development Project undertaken by the Korean Educational Development Institute is to identify problems of the current educational system, find ways of solving them, and develop an alternative system to the present one. Major problems and possible solutions with regard to the instructional system can be outlined as follows;

A. Instructional materials are inadequate. For both the teachers and students, almost no instructional materials are available except for textbooks. The need is imperative for developing teacher's manuals that guide teaching-learning activities for each unit, and programmed materials as well as workbooks for students. Along with these teaching-learning materials, valid evaluation materials need to be developed on the basis of up-to-date theories of evaluation.

B. The present instructional process leaves much to be desired. It is a common practice among teachers to begin instruction without an effort to identify any deficiencies learners might

have in learning the unit. In general, teachers are prone to standardize instruction according to the needs of average students and they hardly give any consideration to the needs of the fast or slow learners. Thus, the development of a new instructional model is urgently needed, which meet the needs of each individual learner without overloading teachers with administrative chores.

C. There is apathy to educational technology. Instructional TV programs receive recognition as a potential breakthrough for an effective instruction, since ITV will reduce the variation of education quality among schools in rural and urban areas, which are in large measure caused by the concentration of competent teachers in urban schools.

When both teachers and learners have access to relevant instructional materials and an improved process of instruction, it is possible to introduce desired changes in our education. In response to this need, KEDI has developed in instructional model on the basis of up-to-date theories of instruction - - a model which is most suitable to the Korean elementary and middle schools in reality. This instructional model will be described in detail in what follows.

II. Proposed Changes in the New Educational System

1. Objectives

The description of E-M Project may well start with defining its major goals and then spelling out the specific means to achieve the goals. There are two sets of goals: One is intrinsic goals-and the other is pay-off goals.

A. Intrinsic Goals

The intrinsic goals describe the experiences students should have when a new educational system is actually in operation. Therefore, these goals serve as the criteria against which evaluation is made and as guide to implementation, field testing, revising, and other development activities.

The intrinsic characteristics of the new instructional system that are envisioned are as follows:

(1) Individual learners will be provided with more learning experiences stimulating higher mental processes such as problems solving, critical thinking and creative thinking abilities.

(2) Individual learners will be provided with more learning experiences for the internalization of values and attitudes and the acquisition of productive skills and knowledge that are uniquely needed for national development. The progress of learning will be periodically monitored, and the results are to be fedback into the teaching-learning processes.

(3) Individual learners will be provided with more opportunities for self-directed learning.

(4) A variety of instructional materials and media will be employed to facilitate the mastery of learning objectives.

(5) Learners will be given opportunities to remedy their deficiencies through supplementary and with of flexible grouping of learners.

(6) Learners will maximize interactions with their teachers individually.

(7) Teachers will be able to devote more time to teaching and guidance.

(8) Schools will be managed in a more rational and systematic way drawing on up-to-date management theories.

B. Pay-off Goals

The pay-off goals are, as defined in the context of the E-M Project, the long term effects of outcomes of the new educational system after it has been operated in all schools a cross the nation. They also provide the ultimate criteria against which the system models and their effectiveness and evaluated. The intended outcomes are expected in due course of time after the new system has been implemented over years. They are defined as follows:

(1) Higher achievement is expected among learners with a commensurate increase in the proportion of those attaining to mastery level.

(2) Higher cost-effectiveness is attained.

(3) Regional gaps in education quality and school differences will be reduced.

(4) Educational opportunities will be enlarged for youth and adults.

(5) The sense of accountability and credibility of school education will be heightened.

2. Instructional System

The Korean Educational Development Institute seeks to develop new educational systems which, hopefully, can help solve some of the problems, plaguing Korean education today. This innovative effort led to

the development of an instructional model.

The development of a new instructional model was coordinated with those of curriculum and management model as dictated by inevitable interactions among them. Hence, the instructional strategies developed by KEDI reflect possible changes to be brought forth in the latters.

The process of instruction in the new model is articulated in terms of stages and the characteristics of each stage. But it leaves room for variation to reflect the characteristics of subject matters. In this response, KEDI has developed a sub-model for each of the major subject-matters, evolved form the general model of instruction, and a variety of instructional materials, including teacher's guides, programmed materials, workbooks, instructional television and radio programs and evaluation instruments.

The following diagram presents, the five stages that an instruction should go through planning, diagnosis, teaching/learning, extended learning and evaluation.

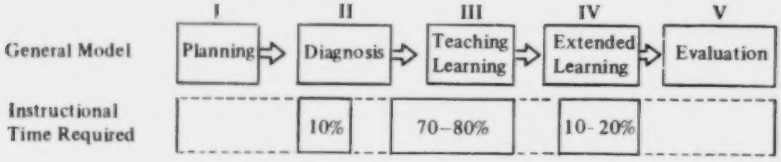


Figure II-1. General Model of KEDI Instructional System

Estimated Number of Instructional Units (Units of Learning) Per Semester[1)]

Korean	10–12	Science	6–8
Mathematics	6–8	Moral Education	4–6
Social Studies	6–8	Music	4–6

1) In this model, an instructional unit is defined as a learning task or tasks requiring approximately eight to sixteen lesson hours of instruction. In designing an instructional unit, consideration is given to the unit structure in textbooks as well as to the interval structure of the learning tasks.

According to the KEDI instructional model, instruction for a learning task goes through five stages as shown in Figure 1. In Planning, a teacher makes lesson plans and management plans for the learning task; in Diagnosis, a teacher identifies deficiences of students in prerequisites for the learning task and makes provisions for remedial work; in the Teaching-Learning stage, main teaching and learning activities take place; in the Extended Learning stage, enrichment and/or remedial instructions are provided based on the formative tests results; in Evaluation, at the completion of instruction for a learning task or tasks, a summative evaluation is conducted.

Each stage will be described in detail below.

A. Planning

In planning instruction for a learning task, the most important precondition is to identify the instructional objectives and their interrelations through task analysis. This task analysis along with the detailed teacher's guide for each instructional unit will be made by the KEDI research team and distributed to individual teachers. The teacher should have a clear understanding of the terminal objectives and the structure of the learning task through careful study of the teacher's guide. As it is shown in Figure II-2, teachers are also supposed to finalize lesson and management plans.

Lesson plans are included in the teacher's guide, but the teacher needs to make some modifications so that they fit the characteristics of the community and particular students in her class.

In other words, the teacher should make detailed plans for student learning activities as well as teacher activities, using the teacher's guide as the guideline. The teacher should make provisions for latent curriculum and make a plan for evaluation activities. KEDI will send the ITV schedule to each individual teacher but the detailed daily time schedule is the responsibility of each individual teacher, who also must plan

for use of special facilities or equipment if they are needed.

B. Diagnosis

The second stage is diagnosis. The purpose of this stage is to identify students' deficiencies in the prerequisites for the learning task and provide them with remedial instruction at the outset of instruction. If diagnostic tests show that students have major deficiencies in their prior learning, a remedial program should be provided to make up the deficiencies whenever possible. For example, when the lesson unit is division, students should have mastered multiplication previously. Therefore, the teacher should identify and help those students who are having difficulty in multiplication.

Although it is not always necessary to have a diagnostic test at the beginning of each unit in all subjects, in science and mathematics such prior testing is usually done. Diagnostic tests and instructors' manuals for their use have been developed by KEDI. Teachers' manuals also contain suggestions for remedial instruction for students with deficiencies. On the bases of diagnostic test results, the teacher should provide appropriate learning experiences for each student. The students who

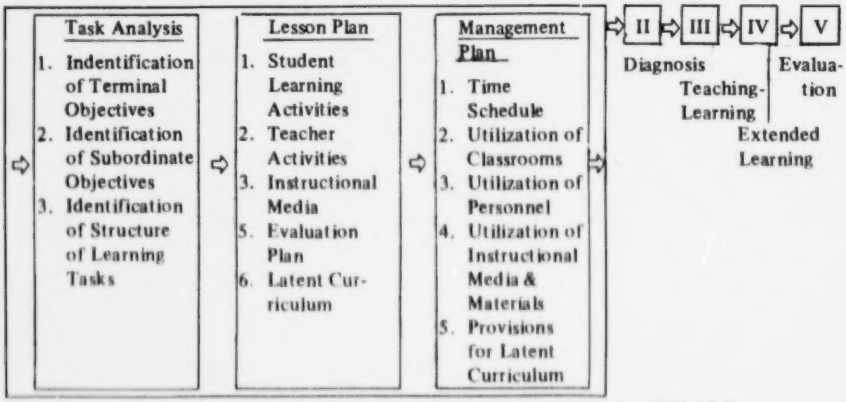


Figure II-2. Planning Stage of the General Instructional Model

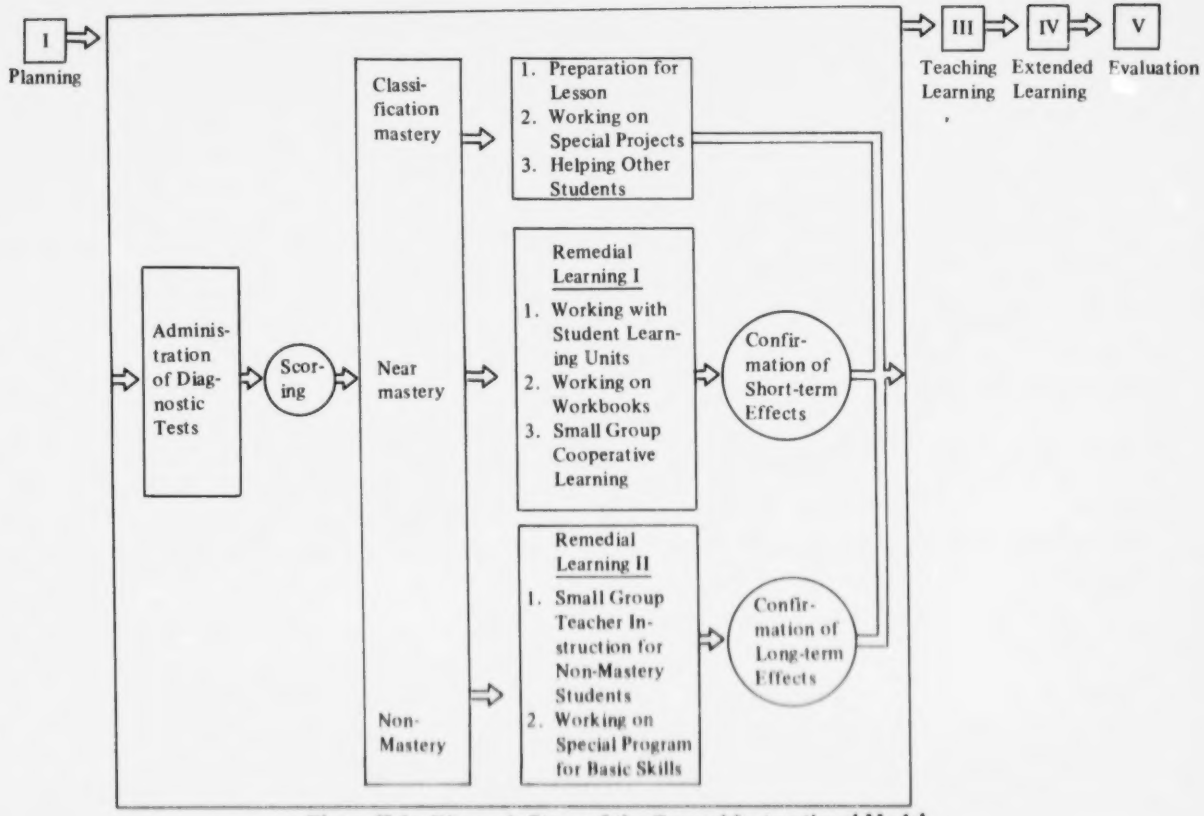


Figure II-3. Diagnosis Stage of the General Instructional Model

have mastered previous learning tesks can either help other classmates or restudy the unit.

The students who have minor deficiencies can either study independently at home with programmed materials and/or workbooks or get some help from more successful classmates. In the following class session, the teacher needs to check on the assignments and be sure all students have mastered the necessary learning task for the lesson unit. The students who have serious deficiencies may have teacher-directed small-group remedial instruction. It can be one or two-hour program, or a semester-long special program to improve reading or arithmetic skills.

C. Teaching-Learning

As Figure II-4 reveals, actual teaching and learning activities take place and approximately two-thirds of the total instructional time is spent in the Teaching-Learning stage. This stage can be further divided into three steps: Instruction, Development, and Elaboration.

It would be desirable to have the formative test every two or three lesson hours, but because of the shortage of time the KEDI instructional system model requires such evaluation only once for approximately every four lesson hours. Teachers use the evaluation materials developed by KEDI.

As a result of the evaluation, teachers are able to identify the particular difficulties encountered by students and thus give more individualized assistance. Also, teachers are able to classify students into three categories: mastery, near mastery, and non-mastery.

To those who achieve complete mastery of the task, special projects or programmed instruction are provided for enrichment, and sometimes these students also reinforce their learning by helping other classmates. To those who achieve only partial mastery of the task, programmed or other instructional materials are specified for independent

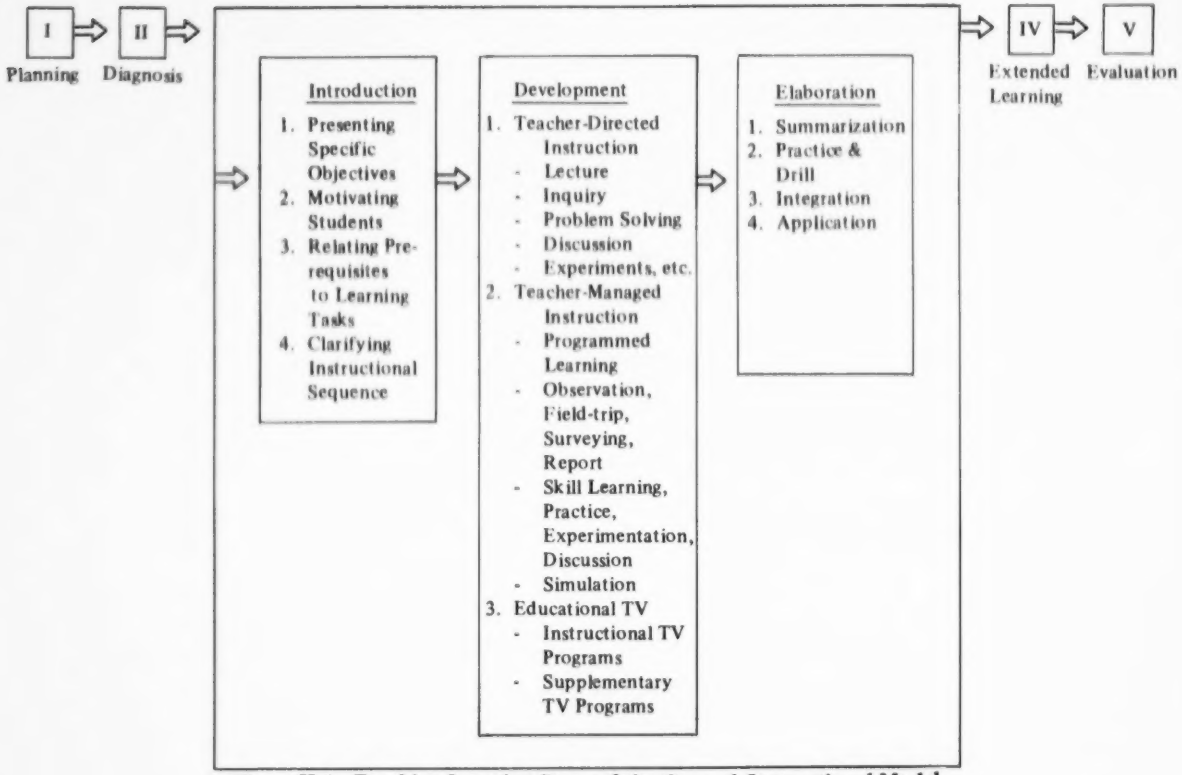


Figure II-4. Teaching-Learning Stage of the General Instructional Model

In Instruction, teachers are encouraged to use the teacher's guide prepared by KEDI to clarify instructional objectives for their students, and to relate a student's previous learning to the present learning task. In Development, the content of the instructional unit is presented to students who respond to the stimuli to attain the mastery of the tasks. A teacher may direct instruction by using the teacher's guide developed by KEDI, or may manage ITV or programmed instruction, or student discussion.

The last step of Teaching-Learning is Elaboration. In Elaboration, the teacher summarizes what has been studied, ensuring student learning through practice and drill, and helping students make applications and generalizations from what they have learned.

D. Extended Learning

Administration of formative tests, and provisions for enrichment, accelerated and supplementary learning are the major activities in the stage of Extended Learning. Formative tests are given to students in the course of instruction in order to identify particular difficulties and to improve instructional activities and strategies.
learning. Sometimes, these students get help from those who have achieved complete mastery of the task.

The teacher himself used the programmed materials and workbooks to give compensatory lessons to those who have greatest difficulty with the task. He also personally checks the student's work to ascertain the results of the enrichment and supplementary learning experiences.

E. Evaluation

Evaluation is the last stage of the KEDI Instructional Model. In this stage, summative tests are administered to students for the purpose of evaluating student achievement on major instructional objectives in the cognitive, affective, and psychomotor domains as well as evaluation of unintentional educational effects.

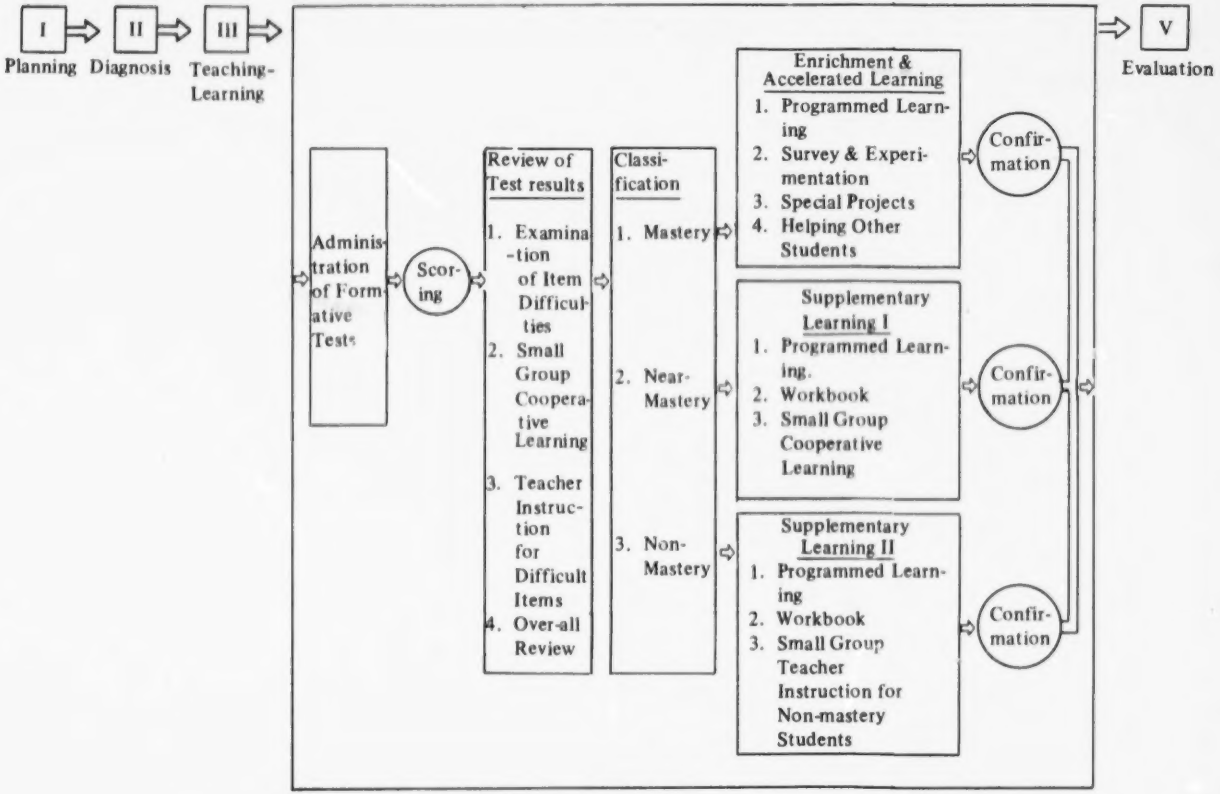


Figure II-5. Extended Learning Stage of the General Instructional Model

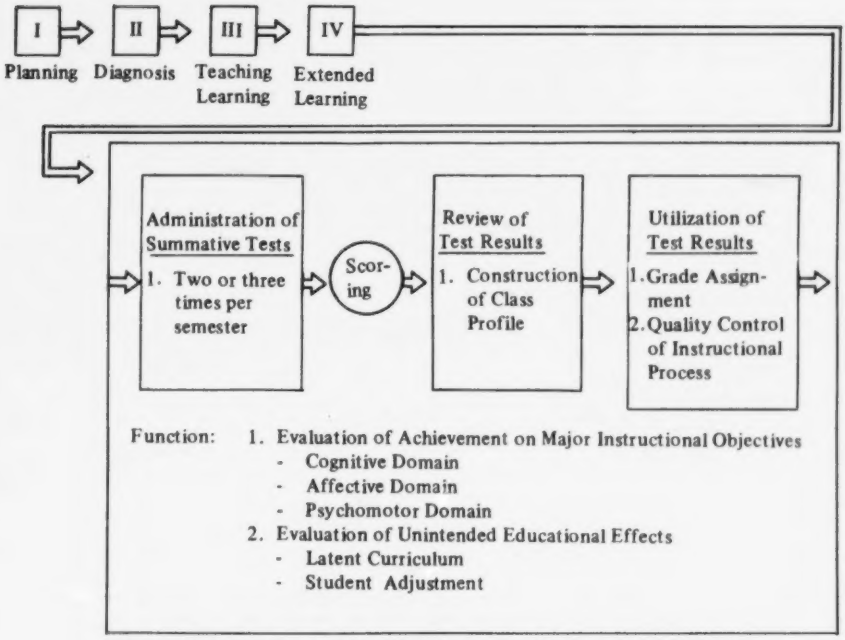


Figure II-6. Evaluation Stage of the General Instructional Model

A summative test may be given at the completion of each unit but to avoid the drastic reduction of instructional time this causes, the KEDI Instructional Model requires a summative test only after completion of two to three instructional units. Although the KEDI provide teachers with test items and other evaluation materials in all the subject areas, teachers may decide to use their own tests. With the test results, teachers construct a classroom profile of student achievement in each subject area, and assign grades to students. A teacher can also use these results to evaluate the effectiveness of his own instruction.

3. School Management System

School management is defined as a chain of activities or processes of establishing the educational goals for school, marshalling human and

material resources, obtaining necessary skills and information, planning their utilization and coordinating these activities toward the accomplishment of the goals.

The development of school management system is primarily concerned with the managerial activities within the school. But the fact that the school interacts with other social systems through organic relationships necessarily directs our attention to the latters in the development of school management system. Therefore, the study of management system was designed to deal with a vast array of other social systems by going through the following stages.

(1) The first stage: This stage will focus on a management system which renders itself for control by the school itself, particularly the one which is closely related with instructional activities.

(2) The second stage: In this stage, efforts are made to develop a management system which will further the development of school into a more effective organization.

(3) The third stage: This stage is concerned with studies on the local administrative systems that exert direct influence on school management. They are the district offices of education and the provincial boards of education.

(4) The fourth stage: This stage extends studies to the administrative systems at the national level centered around the Ministry of Education.

(5) The fifth stage: This stage is designed for a comprehensive study on the social systems, which surround the schools and exert influence on managerial affairs within schools.

The end result of studies suggested in the five stages is the optimum management system which is supportive of the implementation of new instructional system within the scope subject to the discretion of principals.

A. The General Model of School Management

The general model of school management follows three stages, planning - - - implementation - - - evaluation.

Decision-making,communication, supervision and coordination are the general functions of school management, which cut across the entire process of the three stages.

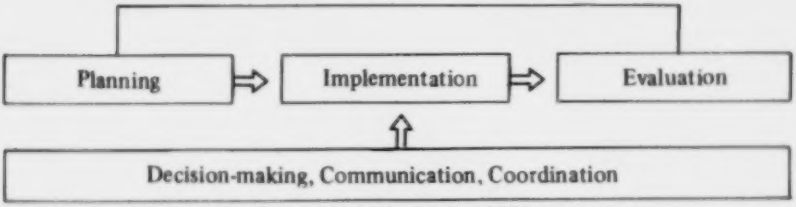


Figure II-7. General Model of School Management

Planning is to forecast the possible events in the future, set forth objectives, and lay out specific activities leading to the attainment of the objectives.

Implementation is to organize personnel and physical settings under which the planned activities are to be implemented and, once the organizing works have been completed, operate curriculum and coordinate supportive activities.

The final stage of school management is evaluation. It examines the management process and determines the extent to which the objectives have been achieved on the basis of the established criteria. The evaluation results are fedback into planning or implementation.

Decision-making is an action to select a set of performance guides, which will help individual members and units effectively achieve the goals of the school.

Communication means the exchange of directives, opinions, and information among members and units of the school and also with related organizations to effect coordination with them.

Supervision means guidance or advices provided to teachers in rela-

tion to improving their instructional and extracurricular activities.

B. Characteristics of School Management System

(1) New Staffing Structure

The new staffing structure is distinguished by strengthening the functions of master teachers, as compared with the existing one attaching status in the order of principal, assistant principal, master teacher and teacher. The master teacher is responsible for a cluster comprising a smaller number of classes. The learning group or cluster varies in size, depending on the situation: The large cluster consists of four classes, the medium one of three classes, and the small one of two classes.

(2) Management by Objectives

Management by objectives insures that school management is implemented in accordance with the established objectives to increase the rationality and consistency of managerial practice.

In rationalizing management, the imperative task is to establish basic educational goals on the basis of a wide range of sources, for these provide the basis for educational objectives for school to achieve the supervision guidelines for the Ministry of Education and other administrative authorities. Also taken into account at this stage are the needs of society and the nation, the needs of children, the problems facing the schools, and the evaluation results of management in the preceding year. It is essential that the process of establishing the objectives be participated in by all teachers and related personnel of the school.

Once the management objectives have been set forth, they will provide the basis for the prescription of specific activities, which are subject to review and evaluation on a periodical basis.

(3) Grade-Centered Management

Shifting away from the existing management centering around a single class this system is designed to strengthen instruc-

tional management by grade, placing emphasis on the functions of the master teacher

The characteristics of grade-centered management are listed below.

(a) It requires that mangement plan at each grade level be established and implemented.

(b) It ensures that all classes at the same grade level engage in learning activities at the speed that allows for an effective airing of ITV or IR.

(c) It requires coordination meetings, participated in by all teachers at that grade, to be held periodically. In such meetings, they will discuss matters pertaining to curriculum operation, management plan for the grade and their progresses, planning and implementation of extra-curricular activities and coordination of extra-curricular activities add coordination of academic affairs at that grade level.

(4) Cooperative Instructional System

The cooperative instructional system encourages the teachers within a cluster to organize a cooperative team, which effects class coordination among them in guiding learning activities.

Its characteristics are listed below.

(a) In the arts and vocational subject areas, departmentalized programs within a cluster will be partially implemented. There will be the teachers who are exclusively responsible for these subject areas. This is a significant departure from the self-contained classroom management system.

(b) It provides for specialized studies for the development of texts and learning materials among the individual teachers within the team. Each teacher specialize the subject area in which he or she excels the others and report findings or outcomes at a general session participated in by all members of the team.

(c) The children who fail to reach the mastery level are given supplementary programs within the cluster. In this case, the teacher will

be responsible for his specialized subjects.

(d) All teachers within a cooperative team participate in daily meetings chaired by the master teacher. In this meeting, they discuss the day's instructional and guidance plans and do preparatory works for instruction.

(5) Mutual Cooperative Learning System

This means a flexible grouping of learners so as to facilitate their learning through interaction and mutual assistance among them. Each team varies in size, ranging from four to nine children.

Taken into account in group learners are achievement level, sociability, personality, sex and so forth which affect cooperation among them. The cooperative learning stressed here applies not only to regular instructional activities but to preview, review, performance of collective tasks and extracurricular activities.

4. Instructional Materials

The instructional materials are intended to facilitate the process of instruction by providing necessary materials and information. These materials are the major factor that distinguishes the KEDI's instructional system from others. There are two types of materials-printed materials and TV and radio programs; the former includes teacher's guide, workbook and evaluation materials. The type of materials offered varies with the stage of instruction [Fig. II-8].

A. Teacher's Guide

Teacher's guide specifies activities which a teacher is supposed to perform in his instruction of subjects. It details out activities characteristic of each stage.

Included in teacher's guide are general information, curriculum by

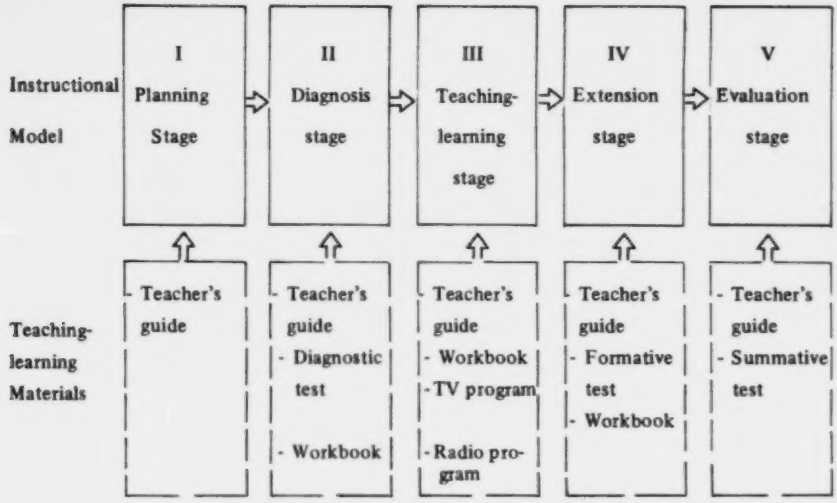


Figure II-8. Type of Materials by the Instructional Stage

grade and subject and specific information regarding how and what to teach, evaluation materials and teaching aids. For planning an instruction, a model design and reference materials are presented; to determine entry levels diagnosis test and remedial materials are given; for actual teaching, a teacher is guided to information materials; the extension stage presents formative evaluation and enrichment materials; and summative evaluation materials are presented at the last stage.

Teacher's guide covers all grade levels and subjects and, in this respect, it features the largest scope of coverage of instructional materials.

B. Workbook

Workbook engages learners in activities leading to the mastery of objectives. It is not so much of supplementary nature as the essential component of the entire process of learning.

The workbook includes exercises ascertaining learner's readiness for learning tasks and remedial materials for those lacking the readiness. At the stage of teaching-learning, it presents information materials related to tasks and questions with blank space to be filled out with a summary. The extension stage exposes a learner to questions ascertaining the progress of learning in relation to the objectives and supplementary or enrichment programs according to the degree of learning.

The workbooks for primary school covers the three stages of instruction, namely, diagnosis, teaching-learning and extension in Korean language, social studies, math, and science. In the case of moral education, physical education, music, fine arts, and vocational subject, diagnosis and extension stages are covered.

C. Evaluation Materials

Evaluation materials of the KEDI's instructional model largely divide up into three types, namely; diagnosis test, formative test and summative test. The term "diagnosis test" is often called preparatory learning or learning for ascertaining progress. The reason for such substitutes is to do away with the conventional notion of test as a burdensome adjunct and bring home to learners that such a process is an integrated part of learning not to be dispensed with.

Diagnosis and ascertaining tests are given in the workbook and summative test is given separately to gain insight into the degree of general achievement. It covers all subject matters.

D. TV and IR Program

The major characteristic of KEDI's instructional model is the utilization of Instructional Television and Instructional Radio in teaching-learning. These are distinguished from educational TV or radio in that they are directly responsible for actual teaching in particular parts of instruction. Whereas, the latter is to enrich or supplement learning experience in general education.

In general, TV is used in the following cases;

(1) To deal with a transformation or evolvement of an event involving a vast time span or spatial distance
(2) To show the field of learning outside the classroom
(3) Instruction relevant to be dramatised
(4) Arts and physical education needing to give an emotional stimulus
(5) persons, events of places not accessible physically
(6) Instruction which defies an effective physical demonstration
(7) Instruction which doesn't allow for an effective demonstration by other media
(8) Instruction which guarantees higher effect of learning through the use of TV.

IR is used in the following cases.

ⓐ For identification of sound or instruction whose effect is created by hearing
ⓑ Instruction relevant to be given in the form of sound drama
ⓒ To develop listening comprehension skill
ⓓ Instruction whose interest is developed by hearing, such as story-telling
ⓔ Instruction which requires audio materials not accessible by teacher
ⓕ To create an emotional excitement
ⓖ Instruction which calls for appealing to fancy and information out of hearing
ⓗ To develop audio-sensory to natural sounds outside the classroom.

III. Development, Demonstration and Diffusion of the New Educational System

1. Small Scale Tryout

Small scale tryout is intended to vindicate the effectiveness of new instructional model teaching-learning materials, and school management model by putting them to trial use by a small target group. This is done in series as a means for revealing their shortcomings to be redressed.

The small-scale tryout involves the participation of 2-3 schools over a period of one or two months. One or two grade levels in each school partakes in it with two or three subjects covered (See Table III-1).

The findings of the four tryouts are summarized as follows:
The first tryout vindicated the effectiveness and relevance of new instruction model and teaching-learning materials. It provided useful findings in the preparation of proto-type instructional materials in math.and science of grades 3 and 5. The second tryout vindicated the feasibility of new instrcuctional model and teaching-learning materials in grade 2.

The third tryout was intended for grade 3 and eight subject matters. What distinguished it from the previous two was to vindicate the feasibility of new instructional model when all subjects are involved and to explore the employability of teaching assistants. The important result was the ascertainment of its feasibility and the determination of a proper amount of materials to be employed. But this revealed some problems of employing teaching assistants.

The fourth tryout is targeted at grade 5 involving all subjects (nine subjects). Its purpose was to examine the possibility of integrating the instructional system with school management system through in-depth analysis of their validities. As a result, the relevance of teaching-learning materials was reconfirmed, and the feasibility of new school management system was ascertained in relation to the instruction model. This

Table III-1. Statistical Data of Small Scale Tryouts

		1st	2nd	3rd	4th	Grade 1 of pri. sch.
Period		73.5.28–6.23 (4 weeks)	73.11.5–12.1 (4 weeks)	74.10.6–11.30 (8 weeks)	75.5.6–6.27 (8 weeks)	78.3.6–4.8 (5 weeks)
Grades		3rd, 5th Grade	2nd Grade	3rd Grade	5th Grade	1st Grade
Subjects		Arithmetic, Science	Moral Ed., Korean Language, Arithmetic	All Subjects (8 Subjects)	All Subjects (9 Subjects)	Orientation Program Korean Language, Moral Ed., Social Studies, Arithmetic, Science
No. of Schools & Students	Exp. Group	- Seoul - 2 schools - 765 students	- Seoul, Inchon - 3 schools - 906 students	- Seoul - 2 schools - 851 students	- Seoul, Anyang - 3 schools - 1,050 students	- Suburban districts of Seoul - 3 schools - 524 students
	Control Group	None	Seoul, Kyungki 3 schools (Same school of exp. Group 576 students)	- Seoul - 2 schools - 690 students	None	None

tryout should be noted for its contribution to the conceptualization of a new educational system comprising the two.

Apart from these tryouts, four kinds of programs were tried out with regard to their relevancy to orient the first graders of primary school for two weeks before exposure to subject matters. They consisted of three rudiment learnings (reading, writing and calculation), language program and calculation program.

As the third tryout revealed some problems of employing teaching assistants, this concept was deleted from the school management system. The teaching-learning materials proved less effective with lower graders. The reason was not so much in the materials themselves as due to the fact that there are fewer retarded learners with serious learning deficiencies. Hence, the fourth tryout reduced the amount of these materials, while drawing largely on supplementary and enrichment materials.

2. Comprehensive Demonstration

The comprehensive tryout is characterized by an attempt to vindicate the effectiveness of the aforementioned models not individually but from the position viewing them as a system. Five comprehensive tryouts were implemented over a period of four years and six months. This is due to the magnitude of works involved in developing teaching-learning materials for all subjects of primary school. Four or five years are taken to ascertain the achievement of the pay-off goals set for the new educational system. Together with them, the intrinsic goals were adopted as an important criterion for the vindication of its effectiveness.

The first comprehensive tryout involved the participation of 14 schools (grades 3 and 5) encompassing 163 classes and 11,198 students. In its second series 16 schools (grade 3, 4 and 5) encompassing 264 classes and 17,721 students participated. The scope of participation increased to 16 schools (grades 3, 4, 5 and 6) encompassing 382 classes and 25,059 students in the third series, 18 schools (all grades except for

grade 1) with 595 classes and 37,193 students in the fourth series and 18 schools (all grades) with 726 classes and 46,226 students (Table III-2).

Besides the participating schools, 5-9 schools were randomly sampled to obtain data for comparison with those of experimental groups.

In the first place, the findings of comprehensive tryout argues for the feasibility of the new educational system. Its effectiveness is found not only in the form of new techniques introduced thereby but as a stimulus for a teacher's inclination toward self-improvement and a systematic approach drawing on theories of learning and management. The teaching-learning materials proved useful in relieving a teacher of the pressure of heavy workload and providing motivation for self-learning.

As the spill-over effect of the new system, the schools using the new instruction model or teaching-learning materials increased in number beyond the pilot schools. These schools now account for one third of total schools, and this fact bears testimony to the effectiveness of the new models.

Second, the new educational system proved effective in upgrading the quality of education. It brought forth higher achievement, the innovation of teaching methods, the diversification of materials, rational school management, the improvement of curriculum operation and the enhancement of teacher's quality.

3. Development of Teaching-learning Materials

As discussed in Chaper II, the teaching-learning materials layout the activities of teacher and learner which lead to the mastering of objectives. It is through these materials that the intrinsic goals of the new educational system are reflected in the actual process of instruction. Without the support of these materials, an instructional design becomes merely a wishful thinking.

Table III-2. Statistical Data of Five Comprehensive Demonstrations

	1st	2nd	3rd	4th	5th
Year	1975	1976	1977	1978	1979
Grade	3,5	3,4,5	3,4,5,6	2,3,4,5,6	1,2,3,4,5,6
No. of schools	14	16	16	18	18
No. of classes	163	264	382	595	726
No. of students	11,198	17,721	25,193	37,193	46,226

A. Development of New Instruction Model by Subject

The instructional model of subject matter is the extension of the general instructional model. Uniquely, there are double needs to be met; it is essential to keep this model in view of the concepts and principles of the general model, as well as reflecting the characteristics of a subject. It should be such that presents instructional methods and strategies relevant to the subject. In most cases, the teaching-learning stage of the general instructional model leaves room to include activities characteristic of a subject. In some subjects, need arises to delete the diagnosis stage or shrink the extension stage.

It is the instruction model of subject that links the curricula in operation to specific classroom activities. This model reflects emphasis on theory-centered curriculum and inquiry approach. The development of such models should be noted for its contribution to the establishment of subject education theories in relation to the curricula in operation.

B. Material Development Model

While the instructional model of subject guides a designing of instruc-

tion, the material development model presents steps to be taken to develop teaching-learning materials. The former is based on the theories of subject education, whereas the latter based on curriculum and learning theories (See Figure III-1).

The material development model includes the following steps.

- Unit study: This stage highlights the ascertainment of unit objectives and the clarification of the relation of the unit with others
- Task analysis: Using Gagné's task analysis method, fact, concepts, laws and procedures are identified and the relations among them are clarified in terms of hierarchical order.
- Instruction design: On the basis of the hierarchical relation, contents to be taught are sequenced; the instruction plan is prepared; and media are selected.
- Material production: This stage features an actual production of materials. Production starts with diagnosis, formative and summative test materials, followed by teacher's guide, workbook and TV programs.
- Evaluation: The produced materials are tested for their validity and relevance. On the basis of findings, the materials are revised and supplemented.

C. Material Development Process

The process of material development saw the participation of a wide range of professionals, including scholars (curriculum, instruction theory and evaluation), subject specialists, teachers and media specialists. The materials were modified in structure, the amount of learning, statements, etc., while they underwent four small scale tryouts. Further refinements were made as deficiencies were found through comprehensive tryout, teacher training and the monitor system comprising pilot and cooperative schools.

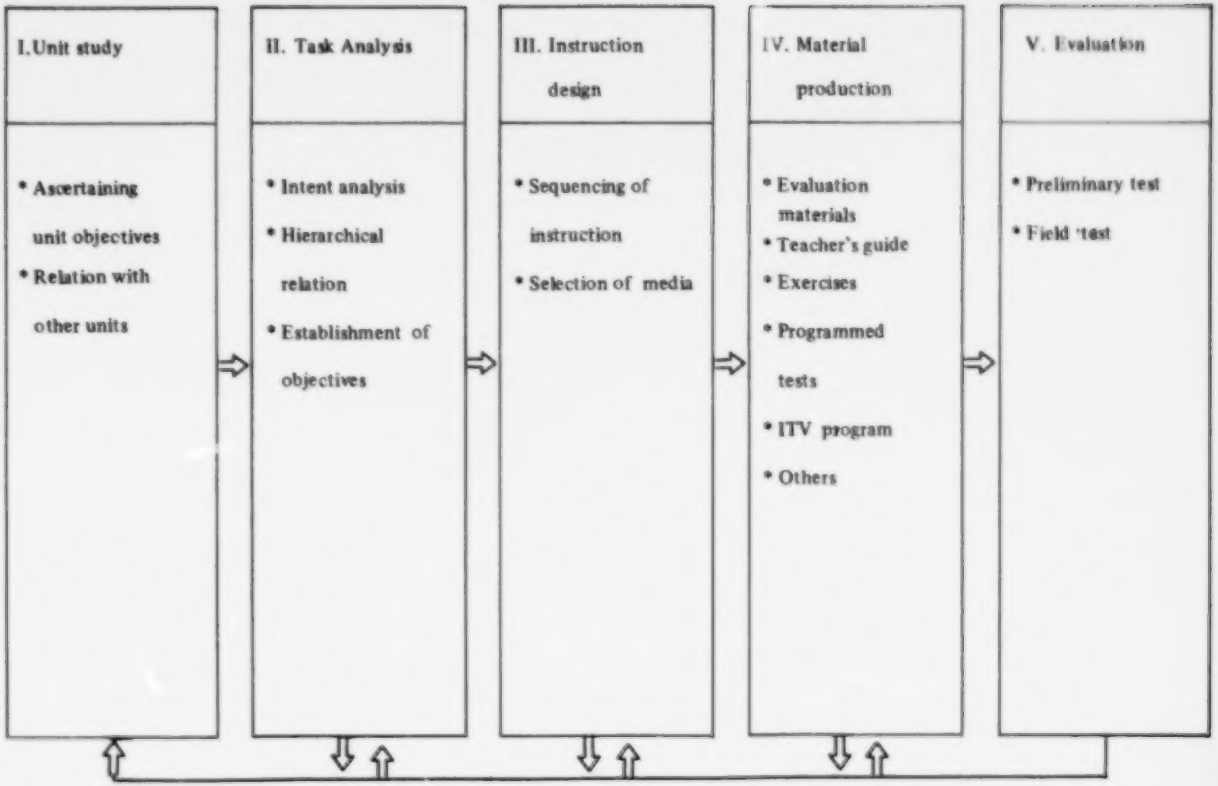


Figure III-1. Instructional Material Development Model

4. Diffusion

A. Need of Diffusion

To deepen our understanding of the new educational system, it is necessary to view it not only in terms of its effect on school education but in terms of its relationship with all aspects of education. The application of the new educational system is not limited to the pilot and cooperative schools; it has made its inroad into the other schools. Trainings conducted by KEDI exposed supervisors, teachers and researchers to the new system, and the participation of professionals in material development gave an added impetus to the diffusion of the new educational system.

The reason for greater attention to non-pilot schools and teacher training are as follows:

First, the development of a new educational system was not simply for the sake of research per se: It was aimed at a fundamental innovation of education. As discussed in Chapter I, the direct motive of the government for the establishment of KEDI was to entrust it with systematic and comprehensive educational innovations. Of the phases comprising the entire process of educational innovations, the diffusion of a new educational system was made an essential ingredient. For this purpose, the government provided strong budgetary and administrative supports. It is natural that an innovative effort does justice to the nationwide diffusion of a new educational system and teacher trainings as the major means of disseminating innovative system.

Second, in the process of research, teachers voiced an imperative need for this innovative undertaking. Particularly, the demand for teaching-learning materials and teacher training surpassed the KEDI's capability of responding to this need. This bears testimony to the demonstrated effectiveness of new educational system. After the entrance examination to middle school was abolished in 1968, primary

education suffered numerous problems which adversely affected its quality. The public concern for primary education was transferred to middle school as it became the place of preparation for entrance to the first-rate high schools. In the meantime, primary education was left uncared and teacher's morale sank to a pathetically low level. Furthermore, the overcrowded classroom and the shortage of laboratory equipment and materials created a climate detrimental to learning and student achievement registered a steady decrease. All of these set up an outcry for an alternative system, and teacher's thirst for educational innovations remained unquenched.

Teachers were interested in teaching-learning materials in particular. Their reactions to a questionnaire survey suggested the effectiveness of these materials in (1) reducing teacher's workload and upgrading teacher's competency; (2) facilitating instruction in over-crowded classrooms in cities; and raising the scholastic achievement of rural schools, and; (3) allowing for an effective operation of under-sized schools in remote areas and islands.

B. Diffusion to Pilot Schools

The diffusion of the new educational system and teaching-learning materials included three stages: they are diffusion to pilot schools, diffusion to cooperative school and diffusion to the other schools.

Diffusion to pilot schools was occasioned by their participation in the small scale and comprehensive tryouts. The scope of participation was given earlier in terms of the numbers of schools, classes and students. In the first comprehensive tryout, five provinces (or special cities) were represented. The second comprehensive tryout covered 11 provinces (or special cities), with a commensurate increase in the number of schools from 14 to 18.

C. Diffusion to Cooperative Schools

1) Need for Cooperative Schools

The cooperative schools represents an intermediate process on the

way to a nationwide diffusion of the new educational system. They were encouraged to apply the new system, whereas the pilot schools were actually responsible for experimentation. Basically, there are two reason for the participation of cooperative schools.

The first reason is found in the goal of the Elementary-Middle School Development project. As pointed out earlier, the goal of the project did not cease to be research per se, but innovation to be made on educational scenes. It is natural that any innovative effort provides a stage for a significant policy decision to be made on the basis of empirical data as to whether a new system should be diffused to all schools.

The pilot school is characterized by its commitment to vindication of the new system's effectiveness and revelation of findings useful in improving and refining it. The cooperative school was characterized by its willingness to apply the new system to a normal school situation and to examine the possibility of its generalization. The findings provided by the pilot schools are not applicable to the cooperative schools, since the former is favored with conditions conducive to innovative undertakings. Hence, the operation of cooperative schools was to reveal the variation of the new system's effectiveness depending on the characteristics of schools and to suggest ways to universal application.

Second, the hasty diffusion of new educational system to cooperative schools was due to the clamour of administration authorities and schools for it. The first comprehensive tryout stimulated interest of teachers in teaching-learning materials, and the subsequent training of teachers provided an increased exposure to the new educational system among educations and administrations. Their demand for a new system was prompted by better understanding of it.

2) Operational Principles for Cooperative Schools

The operation of cooperative schools is based on the following principles. First, each county or city has one cooperative school. The criteria for selecting a cooperative school were ① willingness to under-

take innovations, ② research capability, ③ status of a school in relation to others in disseminating a new system. The selection of a cooperative school was left to the discretion of District Education Offices. Second, the cooperative school was allowed to be selective about what components of the new educational system to adopt, as deemed fit into its setting. Third, the cooperative school was urged to maintain a close relation with the supervisory staff of district education offices and to exercise leadership in educational innovations.

As for supports to the cooperative school, KEDI provided teaching-learning materials at the straight cost, financial aid to cover part of expenses incurred in application, and teacher training. The teacher training included field guidance through KEDI researcher's visit to schools and the intensive training of master teachers sponsored by district education offices. Besides, publications were disseminated and counseling services were provided through correspondence.

3) Scope of Participation

From 1975 to 1980, cooperative schools have participated in the five comprehensive tryouts. For the first three years, each county or city had one cooperative school, and the number of cooperative schools increased after 1978. While there was a modest increase of cooperative schools, the number of classes and students involved in the tryout showed sharp increases.

D. Diffusion to Other Schools

1) Background

In three years after the first comprehensive tryout the new educational system was no longer the monopoly of pilot and cooperative schools. Its application to the other schools marked an important step toward a nationwide application.

As reports revealed the effectiveness of the new educational system there was an increased interest in it among schools. The favorable reactions of schools lead to policy recommendation that the new educational

Table III-3. Statistical Data of Cooperative Schools

	1st Comprehensive Demonstration	2nd Comprehensive Demonstration	3rd Comprehensive Demonstration	4th Comprehensive Demonstration	5th Comprehensive Demonstration	6th Comprehensive Demonstration
Year	1975	1976	1977	1978	1979	1980
Grade	3,5	3,4,5	3,4,5,6	2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
No. of schools	127	145	164	228	268	234
No. of classes	697	1,363	2,670	3,612	4,532	5,970
No. of students	39,387	79,437	147,619	200,374	241,200	227,504

system be diffused nationwide. In response to reports from educational authorities and schools the Ministry of Education organized an evaluation committee composed of 28 members, including scholars, teachers and administrators, and commissioned it to conduct a comprehensive evaluation for five months from May 1978. The Ministry's initiation of evaluation takes on significance for the following reasons. First, the evaluation resulted in an official confirmation of the new educational system by the Ministry of Education. Second, the new educational system, so far confined to pilot and cooperative schools, was given free entrance to other schools under the autonomy of provincial boards of education.

2) Diffusion

Speaking honestly, the diffusion of new educational system to other

schools includes not so much the system as a whole as its components, and among others, teaching-learning materials stand out even the application of these materials was handicapped by the shortage of workbook which was most useful in the process of instruction. The new school management system was presented for trial use, but its application yielded a limited effectiveness due to the lack of systematic training of teachers.

Although the application of new educational system was limited in other schools, a conclusion may be advanced that the teaching-learning materials were of great assistance to teachers. These materials were distributed as follows:

Table III-4. Distribution of Materials to Other Schools

Year	1978	1979	1980	1981
No. of schools	777	1,299	2,308	1,629
No. of classes	4,090	9,103	20,544	12,084
No. of students	9,870	28,363	144,685	164,833

As noticed in the table, there was a rapid increase in the number of schools receiving the instructional materials. In 1980, the number rose to 2,308, accounting for one third of the total number (6,450). Proportionwise, students benefiting from the materials remained an insignificant proportion because of the shortage of workbook. In view of the fact that 20,544 teachers guide instruction according to the new model, it is reasonable to assume that the number of student beneficiaries will increase proportionately.

The teaching-learning materials were also distributed to Korean

residents overseas at their request through the Ministry of Education. Presumably, this request might be occasioned by the information on the effectiveness of materials reaching them through unofficial channels. The countries originating the requests are the United States of America, Iran, Saudi Arabia, Singapore and Indonesia.

5. Teacher Training

In connection with the diffusion of new educational system, KEDI has been engaged in the training of teachers, while maintaining cooperative relations with teacher training instructions.

A. Directive Teacher Training

1) Need

All activities aimed at educational innovations necessitate the training of teachers. The development of new educational system, among others, attaches greater significance to teacher training as an essential ingredient of the innovative project. First, their task involves numerous areas of concern and theoretical complexity which defies a correct understanding unless a systematic approach is adopted. Second, the marked departure of the new system from the old one calls for greater attention to promoting a correct understanding. Third, the subjects involved in this task numbered thirteen, and an effective teaching of these subjects necessitates a significant amount of teacher training.

The first target group selected for training was classroom teachers, but training was not limited to them; master teachers, assistant principals, principals, supervisory personnel and researchers were trained. Teachers from non-pilot and cooperative schools were also given opportunities for training. The training program includes 1) problems of education in Korea and new needs, 2) the theoretical background of new educational system, 3) application of new instruction model and teaching-learning materials, 4) school management system, 5) instruction of

subjects and 6) TV and radio programs.

2) Implementation of Teacher Training

Teacher training was implemented in such forms as orientation, intensive training, field guidance and seminars. Orientation was designed for teachers of pilot and cooperative schools who had never been exposed to the new educational system. It was timed for the beginning of each semester with one or two day duration. In the topics dealt with, emphasis was placed on the utilization of the new instructional model and teaching-learning materials and instructional methodologies relevant to each subject.

Field guidance was coincidental to summer vacation, aimed at teachers with a relatively good understanding of the new educational system. It was of 2-4 day duration, and its contents centered around specific methodologies relevant to each subject. It requested the trainers to visit schools and observe classroom teaching. Problems noticed there in led to a face-to-face consultation in a way to improve the competency of teachers. Sometimes, visitations were occasioned by the school's request. Largely, it was scheduled according to KEDI's plan. By 1976, all localities had been covered by the field guidance. The field guidance often extended into a 5-8 hour seminar which brought together 50-200 teachers in the vinicity.

Seminar was occasioned by the need for the pilot and cooperative schools to make their research findings known among non-participating schools. In this case, the teachers of non-participating schools are invited to observe classroom teaching in accordance with the new instructional model.

The methods of training include lecture, question and answer, and discussion, with the occasional use of slide or VTR. Slide presentation was an essential element of instruction, since it allowed for a systematic summary of what had been learned. Whereas VTR presented a model instruction of each subject.

3) Training Materials

In connection with the training of teachers, KEDI produced a variety of training materials which divide up into three types, namely: (1) four kinds of materials which provide theoretical background of the new educational system, (2) guide to the comprehensive tryouts; and (3) "education in classroom".

4) Teacher Training in Provinces

In addition to KEDI's trainings, those initiated by provincial boards of education need to be mentioned. As the new educational system was introduced to nonparticipating schools, the demand for teacher training

Table III-5. Number of Participants in Teacher Trainings

Year	1975		1976		1977	
	Times	No. of Parti-cipants	Times	No. of Parti-cipants	Times	No. of Parti-cipants
Intensive Training	6	250	36	962	58	4,476
Field Training	–	–	206	20,600	106	10,600

1978		1979		1980		Total	
Times	No. of Parti-cipants	Times	No. of Parti-cipants	Times	No. of Parti-cipants	Times	No. of Parti-cipants
49	4,655	75	1,622	18	1,472	184	13,437
36	3,800	17	1,700	–	–	365	36,700

rose beyond the KEDI's capability and this led the provincial education authorities to take leadership in training teachers. To create enthusiasm at the provincial level, KEDI was commissioned to train the first batch of key trainers for each province. Each group consisted of 5–8 mem-

bers–including classroom teachers, supervisors and researchers–headed by a faculty of teacher training institute. They underwent a four-day intensive training which offered in-depth knowledge of the new educational system, supplemented by the observations of classroom instruction at the pilot schools and discussion on issues raised after class observation. Over the five years of tryouts, the number of education personnel who were well versed with the new educational system increased noticeably. The group of key trainers did more than their shares by organizing them into a coherent system capable of effective supervisory roles.

Table III-6. Publication of Teacher Training Materials

Materials	1975	1976	1977	1978	1979	1980
Training materials	700	3,000				
KEDI's New Educational System			3,500		2,000	
Instruction of subjects I				2,000		
Instruction of subjects II					2,000	
School management handbook					1,000	
Operation guide	700	3,000	3,500	2,000	2,000	1,300

B. Cooperative Relation with Teacher Training Institutions

1) Need for Cooperation

Establishing a cooperative network with teacher training institutions was an effort to facilitate the diffusion of new educational system and to ensure its viability in a long-term perspective. The in-service training

has the advantage of yielding an immediate effect on the diffusion of an innovative system. But its demerit lies in the limited coverage of teachers. Notwithstanding the KEDI's training gaining force, it is still far from meeting the general demand, while masses of new teachers remain beyond the reach of in-service training. The limited effect of in-service training well argues for the earlier exposure of student teachers to a new system by incorporating it into curricula. This way heightens the spill-over effect of teacher education, and it is specialty so when the curriculum is effectively linked to other in-service trainings hosted by the same or an affiliated institution. Thus, the in-service training offers itself as the main catalyst for an innovative system. Establishing a cooperative network with teacher training institutes is an essential process of diffusion. The cooperative relationship may well be considered in two ways: one is with the teacher's college and the other is with the primary school attached to it.

2) Relation with the Teacher's College

The cooperative relation with teacher's college developed into locally-initiated in-service training. The college faculties joined training programs to deepen their understanding of the new educational system. Prior to the locally-initiated training in July 1980, KEDI hosted a four-day meeting with teacher trainers to be followed by visits to classroom. This orientation should be noted for its contribution to enlist their support.

The roles of faculties in teacher's college are expected in two ways. First, they will do a share in promoting an understanding of new educational system by including it in the curriculum of pre-service training. Second, they will partake in the locally-initiated training as resource persons.

3) Relation with Primary School

The cooperative relation with teacher's college brought forth an easier access to the primary school attached thereto. The latter offered

the ground for experimental teaching by student-teachers, and the infusion of the new educational system into this experience produced a profound effect on their attitudes toward this innovative system. KEDI developed cooperative relations with 11 primary schools, holding them responsible for the free distribution of teaching-learning materials and the training of teachers. In 1978, the first year of their participation, grade 2 was involved. In the next year grades 2 and 3 were involved.

Table III-7. Distribution of Teaching-Learning Materials to Primary Schools Attached to Teacher's Colleges

	1978	1979	1980	1981
Grades	2	2,3	2,3	4,5
School	11	11	11	11
Classes	29	58	63	58
Students	1,730	3,480	3,780	3,480

IV. Findings and Results of Implementation

1. Method of Project Evaluation

Apart from the evaluation of the Elementary and Middle School Development Project conducted by KEDI, the Ministry of Education, which commissioned KEDI to undertake this project, and USAID, the funding agency, conducted separate evaluations. This chapter discusses the goals, methods, and findings of these evaluations.

A. Internal Evaluation

The internal evaluation refers to the evaluation conducted by the institute responsible for research and development thereof. The research staff of the institute were divided into research and development team and evaluation team. While the former is involved in small-scale tryouts, the latter concentrated its efforts on the designing and implementation of system evaluation. By the time the comprehensive evaluation was commenced, baseline data were collected and analysed. While the comprehensive tryouts were proceeding, the team conducted an extensive analysis of collected data. A survey was conducted on the opinions of teachers and administrators regarding the possible diffusion of the new educational system.

1) Development of System Evaluation Model

The evaluation activities are broadly divided into intrinsic or instrumental evaluation and payoff or consequential evaluation. The former is purported to suggest ways in which a new system is improved and refined in the process of research and development. The latter attempts to assess the long-term effects of the new educational system on education, that is, the consequences of its application to all schools across the nation.

The intrinsic evaluation is a recycling process providing information

as to whether research and development proceed along the way to the intended goals. Involved in this evaluation are the goals of a new system, tryout plan and methodologies. The findings of evaluation are fed back into the process of research and development. Hence, the intrinsic evaluation is a formative process directed toward a goal. The intrinsic goals of new educational system discussed in this Chapter serve as the criteria for intrinsic evaluation. These goals manifest the experiences that students go through when the new educational system in its true sense is in operation. It is, therefore, against these goals that a judgement is made as to whether the new educational system is successfully in operation.

The payoff evaluation is terminal in sequence and comprehensive in coverage. The payoff goals of new educational system serve as the criteria for this evaluation and the findings therefrom provide significant implications for policy-formulation. To reiterate, the payoff goals manifest what comes after a nationwide application of new educational system as discussed in this Chapter.

The system evaluation model specifies four stages to be included in the intrinsic evaluation, namely; analysis of intrinsic goals, evaluation of tryout plan, evaluation of tryout methodologies and evaluation of findings. The payoff evaluation includes analysis of payoff goals, analysis of baseline data, analysis of tryout findings and vindication of the new system's effectiveness.

The evaluation team defined criteria and methodologies inherent at each stage of evaluation. Both the intrinsic and payoff goals of new educational system were stated in more specific terms to provide direction as to what and how to do to reach the goals. To supplement data, classroom observation, questionnaire survey and testing are employed.

The following is an example of an intrinsic evaluation design that has been evolved through these stages under the objective of developing higher mental processing skills such as problem-solving, critical thinking and creativity.

Table IV-1 Intrinsic Evaluation Design

Objectives	Criteria		Method of Evaluation
	Planning	Process	
1. Students have a lot of experiences developing problem-solving, critical thinking and creativity	a. Include objectives exposing students to such experiences	a. Students are exposed to higher mental processing experiences	a. Examine objectives, exercises lesson plan, and contents designed for higher mental processing in teaching-learning materials
	b. Include questions stimulating the development of higher mental processing	b. Students are tested in this ability	
	c. Include exercises, discussions, leading to inquiry, invention in teacher's activities	c. 1) Teachers are able to diversify learning experiences using discussion, inquiry, invention, etc.	
		2) Present questions stimulating students' creativity and inquiry and analyze their reactions	b. Monitor periodically instruction process to analyze teacher's activities, learning activities and teacher-student interactions
		3) Avoid direct answers or conclusions	
	d. Include learning activities calling for higher mental processing skill	d. Students have more time for observation, investigation, experiment, discussion, etc.	

	e. Include materials giving learning experiences for higher mental processing in ITV and radio programs.		

Table IV-2 Payoff Evaluation Design

Objectives	Objective Specification	Methods	
		Baseline data	Validation of Effect
Improve student achievement	a. Increase the number of students attaining to mastery level, average student achievement and learning gains while reducing individual differences, in objectives related to facts, concepts, principles, etc. *Students attaining to more than 80 percent of objectives $\frac{\text{Post} - \text{Pre}}{100 - \text{Pre}} \times 100$	a. Achievement test results Tool: achievement test	a. Comparison of achievement between experimental and control groups Tool: (1) achievement test, (2) basic learning test, (3) comprehensive thinking test, (4) attitude test.
	b. Increase the number of students attaining to mastery level, average achievement and learning gains in basic learning skills such as reading, writing, computation, etc.	b. Basic learning test results Tool: basic learning test	b. :Comparison of achievement increase between experimental and control groups Tool: (1) achievement test, (2) basic

			learning test, (3) comprehensive thinking test and, (4) attitude test
	c. Increase the number of students attaining to mastery level, average achievement and learning gain in higher mental processing	c. Comprehensive thinking test results Tool: Comprehensive thinking test	
	d. Increase achievement in music, arts and literature	d. Test results covering grades 1–6. Tool: achievement test	
	e. Students have positive attitudes toward school, learning teachers and friends	e. Attitude test results covering grades 4-6. Tool: attitude test	

Table IV-3 Comprehensive Tryout Evaluation Design

Tryout Design	Intrinsic Evaluation	Payoff Evaluation
Objectives 1. Tryout the new ed. system in all primary schools 2. Vindicate the effectiveness of components of the new ed. syst. 3. Vindicate the feasibility of components of the new ed. syst. Period: Sept. 1975-Feb. 1976 Grades: 3, 5 Subjects: all Experiemental Schools: 16 (5 in large cities, 8 in small cities, 3 in rural areas) Control Schools: 16 (5 in large cities, 8 in small cities, 8 in rural areas)	1. Planning evaluation (June-July 1975) – Instruction model – School management – Teacher training program – Materials: Objectives, instruction design, learning experiences, test items, – Tryout design: feasibility, supportive structure, school conditions, readiness for innovation 2. Process Evaluation (Sept.1,1975-Feb.1976) – Teacher-student activities – Utilization of teaching-learning materials – Curriculums, instruction process, – Analysis of teacher's tasks – Corrective measures 3. Analysis of findings (Feb. 1976-April) – Achievement of intrinsic goals – Whether to change intrinsic goals – Relevance of teaching – Learning materials, teacher training, instruction model, school management, etc. – Corrective measures	1. Pretest (Sep. 1-5, 1975) – Achievement test (summative test of 1st semester, compared between experimental and control groups) – Basic learning test, compared between experimental and control groups – Comprehensive thinking test comparison between experimental and control groups – Attitude test, comparison between experimental and control groups 2. Post test (Feb. 5-10, 1976) – Achievement test – Basic Learning test – Comprehensive test – Attitude test 3. Other (Sept. 1, 1975-Feb. 29, 1976) – Analysis of inputs pre and post analysis – Observation of teacher's activities and interview – Examination of school facilities, equipment – Examination of out-of-school education – Examination of school Management – Attitude toward the new educational system

		4. Analysis of 1st comprehensive tryout – Achievement comparison between experimental vs. control schools, and pre vs. post tryout (achievement, basic learning, comprehensive, and attitude tryouts) – Cost-effect analysis between pre vs. post tryout between experimental vs. control schools – Regional variation of achievement between pre and post tryout – Opinion of students, teachers and parents about the new ed. system

2) Evaluation of Comprehensive Tryout

(1) Purpose

The evaluation of comprehensive tryout had double imperatives – that is, to revise the new educational system and to validate its effectiveness. The first purpose was served by the intrinsic evaluation and the second purpose by the consequential evaluation.

Each of the five comprehensive tryouts involved these two dimensions. The first two focussed on the intrinsic evaluation, whereas the last three placed emphasis on the consequential evaluation. The intrinsic evaluation is characteristic of small scale tryout. In the comprehensive tryouts, intrinsic evaluations were conducted on a scatter-shot basis as need arose to test the components of the new educational system. On the other hand, there was a consistent implementation of consequential evaluation in the five comprehensive tryouts. There are good reasons for greater emphasis on the consequential evaluation. First, research, development and tryout all are considered a stepping stone to the primary goal of innovating primary and middle school education. The final decision for a nationwide implementation of the new educational system must be based on its demonstrated effectiveness and feasibility. In other words, the empirical data needed for policy-decision are produced by the consequal evaluation alone. Second, by analysing the findings of small scale tryouts against the payoff goals of a new system, it is possible to provide significant implications for system development. To put it in other way, it is essential to conduct a consequal evaluation at the intermediate point of system development in order to keep the new system in view of the ultimate goals that it is destined to achieve. The achievement of intrinsic goals can be ascertained by reviewing them against payoff goals.

(2) Characteristics of the Evaluation of Comprehensive Tryout

The consequential evaluation is characteristic of the comprehensive

tryout. The points to be considered in this evaluation are as follows:

ⓐ The payoff goals of new educational system are interrelated and the essential element of these goals is student achievement. The assessment of student achievement is not to be dispensed with in evaluating the effectiveness of the new educational system. Over the period of five comprehensive tryouts, data of student achievement were collected six times.

ⓑ The effectiveness of new educational system can not be measured in its absolute terms; it is essentially measurable in relation to the existing system. Therefore, an attempt to evaluate the new system demands that the target audience participating in tryout be divided into experimental and control groups and that they be compared in term of achievement level.

ⓒ Experimental and control groups were sampled in such a way that produces statistically meaningful difference at the smallest size. Stratified sampling was adopted to produce regional variation subject to analysis. For the convenience of data collection, clustered sampling was employed in selecting schools and classrooms.

ⓓ Achievement test was developed by teachers in consultation with subject matter and evaluation specialists. The participation of these specialists increased the validity and reliability of testing items. Every year saw the replacement of testing items by 30 percent in order to prevent students' prior knowledge of them. The reason to avoid the replacement of all testing items was due to the need for maintaining compariability with those of the previous year.

ⓔ The control group could not keep the same schools throughout the entire period of five comprehensive tryouts.
It was due to a considerable increase in the number of schools adopting partially the new educational system after the third comprehensive tryout. Therefore, efforts were made to select the least-affected schools for the control group.

(3) Tools for evaluation of comprehensive tryout the following tools have been developed for evaluation of comprehensive tryout

ⓐ Achievement test

Achievement tests were developed for the grade levels involved in the tryouts. Development started with grades 3 and 5. For the Fifth Comprehensive Tryout, tests for all grade levels were developed on the basis of norm-referenced criterion. To economize the expenditure and for the convenience of control, the test was limited to the written type.

In the case of grade 1, questions were stated by comprehensible pictures in the place of written statements in order to avoid achievement difference resulting from the different comprehension of Korean language. Before a test started, teacher was required to read the questions and make necessary clarifications.

ⓑ Test of Basic Learning Skill

The test of basic learning skill is not concerned with any particular subjects; rather it is intended to determine the mastery level of essential requirements for learning, commonly applicable to all subjects. The test is composed of such components as vocabulary, reading comprehension, concepts of number, calculation and knowledge regarding how to use resource materials.

ⓒ Attitude Test, Self-Concept Test, and Learning Habit Test

These tests are the means of testing the objectives in the affective domain. The attitude test attempts to provide information regarding learner's consciousness of objectives, interest in learning and attitude in relation to teachers and classmates. The self-concept test determines whether a learner approaches learning with confidence and whether he takes pride in his ability to learn. And the learning habit test gives insight into the degrees to which a learner is directed toward self-learning and concentrate attention on learning. Its measurement was based

on the Likert's five-point rating scale.

ⓓ Classroom Observation Record

Employed for classroom observation was the revised version of Minis and Shrable's Model. Analysis criteria were developed in two matrix; One was for an analysis of the question-answer process and the other for an analysis of teaching activities. The former again divides up into two levels in terms of what it is intended for, namely; recreative and inference-stimulating criteria. The latter comprise three types-teacher initiative, student response, and teacher response. The two matrix were inter-related to produce six criteria of analysis. In addition, verbal and non-verbal communication were added to the check list. Question-answer was recorded at the interval of three minutes. Recording was numbered to represent the criteria analysis; recall centered teacher initiation was represented by 1, recall centered student response by 2, and recall centered teacher response by 3, inference-application centered teacher response by 1, and inference-application centered student response by 2'. Verbal and nonverbal communications were represented by "v" and "n" respectively.

ⓔ Survey on Opinions

Opinions regarding the effectiveness of new educational system were surveyed to increase the objectivity of evaluation. Involved in the survey were teachers of pilot and cooperative schools, principals, assistant principals, subject matter specialists, scholars and parents. The survey attempted to provide imformation on the effectiveness, feasibility and the superiority of the new system to the existent one. Apart from questionnaires, interviews with the concerned personnel were conducted.

B. External Evaluation

1) Evaluation by the Ministry of Education

The government's decision to undertake the elementary-middle school development project obligated itself to provide necessary supports as a promoter and financing agency. As the evaluation of new education system was nearing its end, the Ministry of Education launched an extensive evaluation. It formed an evaluation committee composed of 28 persons representing education, academic and the public.

The evaluation was concerned with the instructional model, school management model, teaching-learning materials and the changes that were actually made in student achievement and the ways of managing school.

The duration of evaluation was five months from May through September, 1978. 18 schools were selected among the pilot and cooperative schools, one or two from each city or county, to participate in the evaluation.

To begin with, achievement test was given to pilot and control schools in six subjects–Korean language, math., social studies, science, music, and fine arts of grade 5. Analysis was made of the test results in a way that vindicates the effectiveness of new models as accounting for the difference of achievement level. A total of 244 scholars and primary school teachers participated in the analysis of findings. To supplement the analysis of achievement, survey was conducted to elucidate the opinions of teachers, parents and supervisors directly or indirectly associated with the new education system. To visualize schools operated in accordance with the new school management model, committee members visited three schools. The analysis of findings involved 18 meetings to increase the objectivity of evaluation.

ⓐ Validity of New Educational System

Discussion on the validity of new-educational system involves theoretical and practical dimensions. Along these lines, criteria were set for each of the instructional and school management models.

The instructional model was viewed from instructional objectives, knowledge structure, individual needs and the concept of evaluation. The findings of evaluation argued that the new model was favorably compared with the existent one from these criteria. They are summarized as follows:
First, instructional objectives are clearly stated; learning tasks are logically sequenced, instruction caters to individual needs; and evaluation is given a heavy weight. Second, the new instruction model leaves room for flexibility as needed in accordance with the characteristics of each subject matter, cognizant of a possible misunderstanding of it as demanding a unified pattern of instruction. Third, the new instruction model allows individual learners to lay a solid ground for subsequent learning, thus reducing the regional variation of achievement.

Criteria for evaluating school management model reflects the view that school management per se resembles an input-process-output model. They should be such that encourages teaching staffs to participate in managerial affairs and bring them into a cooperative network based on the "division of labor" principle. Consequently, the sense of accountability is heightened. They also should allow for a flexible grouping of learners and immediate response to the necessity of rescheduling class hours in accordance with school situation. Against these criteria, the new school management system is favorably compared with the existent one.

The practical validity of each model is retained when the two models are merged into a simple system. This validity is manifested in the changes actually made on educational scenes. The new educational system produces higher achievement under the present school conditions; disposes teachers toward search for new teaching methods; allows for clear specification of objectives and changes the mistaken notion of evaluation; does away

with problems coming from the panucity of teaching-learning materials and is helpful in raising the general achievement level; reduces regional disparity of achievement; helps to rationalize school management; and produces a climate supportive of teacher's effort to improve their professional competency.

The evaluation also pointed out areas deserving of due consideration to improve the new education system. First, teaching-learning materials for retarded learners need to be refined. Second, teacher's guide should integrate the contents of workbook. Third, programs need to be developed for guidance and extra-curricular activities. Fourth, the new school management model is not relevant to undersized schools. There is a need for an alternative model which fit these schools.

ⓑ Teaching-learning Materials

Evaluation of teaching-learning materials provided the following findings: First, the objectives and contents included in the teacher's guide reflects the intentions of curriculum. Second, instructional plan which distinguishes concepts from activities introduces a new way of content analysis, Third, instructional activities are well sequenced and information at each stage is specific enough. Fourth, workbook reflects the intentions of curriculum consistent with those of teacher's guide. Fifth, it presents exercises guiding self-learners to the mastry of instruction objectives. Sixth, learning tasks are logically sequenced.

On the other hand, the teaching-learning materials reportedly leave the following to be desired. First, the teacher's guide should present a wide range of reference materials. Second, it should diversify teaching activities which meet the situational needs of various localities. Third, the workbook should present a wide range of reading materials relevant to the topic. Fourth, it should be made of quality papers for lower graders, with

sufficient space given for learners to take note.

ⓒ Evaluation of End Results

The trial use of new educatioal system resulted in actual changes felt on educational scenes. First, achievement test of pilot schools registered an average of 75 points, an increase of 15 points over that of control schools. Individual difference was reduced. Rural schools showed heigher level of achievement than those in cities. Second, the new educational system cultivated self-learning attitude with a concomitant improvement of ability to express ideas. Third, remarkable changes were noticed in school management. Instruction followed the schedule; the competency of teaching subjects improved, opportunities were employed to benefit from brain storming of teachers in a cooperative mood in the process of preparing instruction and relevant materials; teachers were helped in preparing for instruction in the subjects they were not well versed with, such as music, arts and physical education.

All data aforementioned led to the conclusion that the new educational system is an effective and viable alternative which deserves of consideration for its nationwide implementation.

2) Evaluation by Donor Agency*

Apart from evaluation at home, U.S.A.I.D. (Agency for International Development) conducted a separate evaluation as the financing agency of the Elementary and Middle School Project. AID commissioned Dr. Paul Mascner, Professor of University of Pittsburg, to organize Analytical Case Study Team for the Korean Educational Development Institute. The team conducted a longitudinal evaluation from July 1975 to February 1979. The team made four visits to Korea and produced three interview reports and one final report. To follow up on this, another evaluation was undertaken by AID Team headed by Dr. K.A. Witherell

* See Appendix 2.

in 1981 and report entitled "Korea Elementary-Middle School Pilot Project-Project Impact Evaluation" was published. The collection of data was mainly through interviews with teachers, scholars and educators.

The final report of analytical case study commented on the new educational system as follows:

ⓐ The remarkable success in developing a new educational system is attributed to the strong determination of Korean people for educational innovations that serve national needs.

ⓑ Clearly defined goals of education, a new curriculum and new effective instructional materials, a new instructional system and school management - - all these set the stage for a comprehensive reform efforts.

ⓒ Data generated by a series of tryouts support the effectiveness of the new educational system and suggest national implementation at the earliest feasible time.

ⓓ The effectiveness of new educational system, initially intended for primary and middle schools, will be transmitted to high schools and colleges.

ⓔ The demonstrated effectiveness of TV and radio programs enlists a strong endorsement of the public for the use of broadcasting media in general education.

On the basis of these comments, the case study team concluded as follows:

KEDI has in a few short years compiled a remarkable record of success as Korea's educational research and development agency. Its achievements in the monumental tasks of the Elementary-Middle School Development Project have laid the ground work for a fundamental reform of education for the nation. Its new role in the preparation of textbooks suggest even greater influence in the years ahead in the modification and improvement of the curricula at elementary and secondary levels of schooling. Its significant involvement in educational innovations brought KEDI to a full stature as the national research and develop-

ment center. In rapidly developing countries like Korea, such an institute is essential as the prime mover of national development. The primary purpose of KEDI is to initiate the direct educational innovations through involvement in basic studies and policy and planning activities-the role in the long-range role of education in national development.

The marked success in KEDI's educational innovations is the result of its ambitious involvement in all aspects of education, not limited to specific goals. This increased the applicability of new systems to other countries. The effectiveness of new instructional model was amply demonstrated. The instructional materials and TV and radio programs proved helpful in upgrading education reality.

It was unfortunate that the Elementary-Middle School Development Project has to be revised due to technical problems of transmitting system. The failure of TCOM system to work led to a virtual cancellation of its plan to use a balloon, causing so much delay in the commencement of educational broadcasting. The technical problems was the determinant factor for the failure of Elementary-Middle School Development Project to achieve all goals to the fullest extent.

2. Evaluation of Intrinsic Goals

The intrinsic goals denote the experiences that learners encounter when the new educational system is in operation. These goals broadly divide up into six categories. First, the new educational system places emphasis on the development of higher mental processes including problem-solving, critical thinking and creativity. Second, it exposes learners to experiences leading to the cultivation of attitude, value and knowledge directed toward national development. Third, it enables learners to eliminate learning deficiencies through a periodical assessment learning progress. Fourth, it provides more opportunities for self-learning. Fifth, it encourages the utilization of various instruction materials and media. Sixth, it enlarges the opportunity for supplementary and

enrichment programs and allows for a flexible grouping of learners. Against these criteria analysis was made of the specific experiences of pupils to determine the degree to which the intrinsic goals have been achieved.

A. Achievement of Intrinsic Goals

The achievement of intrinsic goals is rated on a three-point scale. Table IV-4 presents an overview of the quantified achievement which facilitates comparison between goals, between semesters and between the groups voicing opinions. The total comprehensive indices register 2.61 and 2.75 in the first and the second semester respectively, indicating that nearly 90 percent of the intrinsic goals were achieved. The second semester registered higher points than the first semester, suggesting that the degree of achievement becomes higher with the passage of times. This finding vindicates the effectiveness and relevance of the new educational system.

Comparing of achievement by goal, higher points were registered in "periodical assessment of learning progress", "utilization of various instruction materials", "more opportunities for supplementary and enrichment programs". The low points shown in "opportunity for self-learning" (the first semester) were accounted for by the lack of understanding of the new education system. The low points in "learning experiences directed toward national development" (the second semester) were due to the limited room for inclusion of new experiences in such subjects as math., science and physical education.

Table IV-4 Achievement of Intrinsic Goals

(Maximum point is three points)

Intrinsic Goals	1st semester					2nd semester				
	Ordering No.	Comprehensive index	Instruction checklist	Questionnaires for teacher	Ques. for students	Ordering No.	Comprehensive index	Instruction checklist	Questionnaires for teachers	Quest. for students
1. Pupils have more learning experiences for higher mental processes, including problem solving, critical thinking and creativity.	3	2.65	2.29	2.83	–	5	2.60	2.06	2.88	–
2. Pupils have more learning experiences in value, attitude, knowledge and productive skills that are directly related to national development.	4	2.63	–	2.63	–	6	2.25	1.35	2.70	–
3. Pupils have their learning periodically tested and use feedback for remedying learning deficiencies.	1	2.88	2.70	2.92	2.90	2	2.82	–	2.83	2.80
4. Pupils have more opportunities for self-directed learning.	6	2.58	1.73	2.81	2.66	4	2.62	2.20	2.85	2.15
5. Pupils have access to various learning materials and media.	2	2.66	2.19	2.56	2.88	3	2.79	–	2.67	2.85
6. Pupils have more opportunities for remedial and enrichment learning programs.	5	2.60	1.64	2.65	2.89	1	2.87	–	2.72	2.93
Total Comprehensive Index			2.61					2.75		

Table IV-5. Learning Experiences for Higher Mental Processes in Instructional Materials

Classification		Teacher's guide												Workbook			Evaluation test								
		Total			Instruction			ITV instruction			IR instruction						Total			Formative test			Summative test		
		N[1]	F[2]	%[3]	N	F	%	N	F	%	N	F	%	N	F	%	N	F	%	N	F	%	N	F	%
Instructional objectives or Test items	Total	1,261	544	42.1	983	418	42.5	184	76	41.5	94	50	53.2	240	143	39.3	1,068	433	40.5	530	196	40.0	538	237	44.1
	1st semester	672	236	35.1	507	507	34.3	98	32	32.6	67	30	55.9	137	66	48.2	593	99	33.5	271	86	31.7	322	113	35.1
	2nd semester	589	308	52.3	476	244	51.3	86	44	51.2	27	20	74.8	103	77	74.8	475	234	49.3	259	110	42.5	216	124	57.4
Instruction hours or Testing hour	Total	458	353	77.1	359	277	77.2	65	47	72.3	34	29	85.3	250	172	68.8	95	86	86.9	58	52	89.6	41	34	82.9
	1st semester	235	177	75.3	180	136	75.5	32	22	68.8	23	19	82.6	123	83	67.5	50	43	86.0	29	26	89.6	21	17	81.0
	2nd semester	223	176	78.9	179	141	78.8	33	25	75.8	11	10	90.9	227	89	70.1	49	43	87.8	29	26	89.6	20	17	85.0

1) refers to the number of objects involved in analysis, that is instructional objectives, instruction hours, evaluation items and evaluation hours.
2) denotes the number of subjects related to higher mental processes.
3) means the percentage of subjects for higher mental processes to the total.

B. Higher Mental Processes

(Intrinsic Goal 1)

The new educational system finds one of its intrinsic goals in providing learning experiences for higher mental processes such as problem-solving, critical thinking and creativity. In an attempt to determine the degree to which this objective has been achieved, analysis was made of the teaching-learning materials in terms of the amount of these experiences reflected in objectives, teaching-learning activities, and evaluation materials. This analysis was facilitated by quantifying the learning experiences stimulating discussion, inquiry, invention, experiment and observation.

As noticed in the table, the second semester offered more of these experiences than the first semester. By and large, more than half the total learning experiences (49-85%) were found conducive to higher mental processes. This needs to be further qualified by semester. In the first semester, 35 percent of objectives in the teacher's guide stimulated higher mental processes and 75 percent of total instruction hours devoted to these learning experiences. The workbook showed 48 percent of objectives and 69 percent of total learning hours directed toward this end. 34 percent of evaluation materials stimulated higher mental processes for answers.

The second semester registered higher percents. In the teacher's guide, they rose to 52 and 79 percents respectively. The workbook showed 75 and 70 percents respectively. The evaluation materials relevant to higher mental processes account for 49 percent of the total.

These statistical data put it beyond doubt that the new educational system provides more learning experiences conducive to the development of critical thinking, problem-solving and creativity. In order to provide an additional evidence in support of this conclusion, teacher's opinions were surveyed and its findings, as quantified in Table IV-6, provide consistent implications in support of the new education system.

Table IV-6. Teachers' Reactions to Learning Experiences in Higher Mental Processes

Responses to questions	1st semester (N=155)		2nd semester (N=163)		Average (N=318)	
	F	%	F	%	F	%
Instructional objectives are always presented	151	97.4	161	98.8	312	98.1
Instructional activities related to higher mental processes are emphasized as the teachers' guide suggests.	129	83.2	140	85.9	269	84.6
More opportunities are provided for inquiry, invention and critical thinking	144	92.3	157	96.3	301	94.7
Pupils raise more questions related to higher mental processes.	104	67.1	134	82.2	238	74.8
Pupils are exposed to variety of approaches to solution of problems.	137	88.4	157	96.3	294	92.5
Pupils' opinions are respected.	148	95.5	159	97.5	307	96.5
There are more frequent presentation of instructional objectives which stimulate higher mental processes	149	96.1	163	100.0	312	98.1

C. Learning Experiences Related to National Development

(Intrinsic Goal 2)

The new educational system is expected to provide more learning experiences conducive to the development of values, attitudes and productive skills that are directly related to national development. To determine the degree to which this goal was achieved, analysis was made of teaching-learning materials in terms of the amount of these learning experiences reflected in objectives, teaching-learning activities, and evaluation materials. The learning experiences meant here were further qualified by specifying instances and teaching methods considered to facilitate the development of relevant value, and skills (e.g. visits to places of interest, information on national development, illustration of heroic deeds of patriots, etc.). The findings of this analysis are quantified as shown in Table IV-7.

As noticed in Table IV-7, the learning experiences related to national development account for 6–26 percent. In the first semester, the teacher's guide shows 13 percent of objectives and 14 percent of teaching activities related to national development. In the workbook, one percent of the objectives and 5 percent of learning experiences had relevance to national development. Four percent of evaluation materials were intended to measure development-related values and skills.

The second semester showed considerable increases in proportion. In the teacher's guide, they rose to, 10 and 18 percents respectively. The workbook showed 20 and 22 percents respectively. 12 percent of evaluation materials were found relevant to national development.

This intrinsic goal shows relatively low degree of achievement, compared with others. This fact may well be accounted for by the contents of the existing curricula of primary school, which emphasizes knowledge inherent in subjects. This tendency is more prominent in such subjects as math., science and physical education. Given this fact, it may be concluded that the new educational system gives a substantial place to

Table IV-7. Learning Experiences Related to National Development in Instructional Materials

Classification		Teachers' guide												Workbook			Evaluation test								
		Total			Instruction			ITV instruction			IR instruction						Total			Formative test			Summative test		
		1) N	F	%	N	F	%	N	F	%	N	F	%	2) N	F	%	2) N	F	%	N	F	%	N	F	%
Instructional objectives (Test items)	Total	1,261	141	11.2	983	99	10.1	184	18	9.8	94	24	25.5	240	22	9.2	1,068	79	7.4	530	27	5.1	538	52	9.7
	1st semester	672	84	12.5	507	61	12.0	98	8	8.2	67	15	22.4	137	1	0.7	593	24	4.0	271	5	1.8	322	19	5.9
	2nd semester	589	57	9.7	476	38	8.0	86	10	11.6	27	9	33.3	103	21	20.4	475	55	11.6	259	22	8.5	216	33	15.3
Instructional hours (Testing hours)	Total	458	72	15.7	359	53	14.8	65	11	16.9	34	8	23.5	250	34	13.6	99	18	18.2	58	8	13.8	41	10	24.4
	1st semester	235	33	14.0	180	24	13.3	32	4	12.5	23	5	21.7	123	6	4.9	50	8	16.0	29	3	10.3	21	5	23.8
	2nd semester	223	39	17.5	179	29	16.2	33	7	21.2	11	3	27.3	127	28	222.0	49	10	20.4	29	5	17.2	20	5	25.0

1) Total number of instructional objectives analyzed or total hours of instructions
2) Number of testing items analyzed or total hours of evaluations

those learning experiences in its teaching-learning materials.

Likewise, teacher's opinions were suveyed to provide supplemental data in support of this conclusion:

Table IV-8. Teachers' Reactions to Learning Experiences Related to National Development

Responses to questions	1st semester		2nd semester		Average	
	F	%	F	%	F	%
The instructional objectives are frequently presented for value and attitude necessary for national development	152	98.1	159	97.6	311	97.8
Instruction related to the above is systematically performed	153	98.7	162	99.4	315	99.1

Table IV-8 evidences clearly that teachers were doing their bests to maximize development-related activities within the given limit. This is also indicative of their belief in the new educational system, which presumably comes from a true understanding of its intent and implications for educational innovations.

D. Periodical Checking of Learning Progress

(Intrinsic Goal 3)

The new educational system is purported to provide a periodical checking of learning progress and supplementary programs that remedy learning deficiencies. In order to determine the degree to which this objective was achieved, analysis was made of teaching-learning materials with regard to their allowance for a periodical checking of learning progress and feeding back the findings for improvement. The frequency of checking and feedback was counted by each stage of instructional

Table IV-9. The Percentage of Checking Learning Progress and Feedback in Learning Materials

Classification		Total			Diagnosis test			Formative test			Summative test		
		N	F	%	N	F	%	N	F	%	N	F	%
Checking hours	Total	21,320	3,070	14.4	15,480	540	3.5	16,920	930	5.5	17,640	1,580	9.1
	1st semester	11,240	1,755	15.6	8,200	325	4.0	8,560	550	6.4	9,720	860	9.1
	2nd semester	10,080	1,315	13.0	7,280	215	3.0	8,360	380	4.5	7,920	720	9.1
Feedback hours	Total	18,200	1,570	8.6	14,720	495	3.4	16,680	1,075	6.4	–	–	–
	1st semester	10,080	790	7.8	7,800	275	3.5	8,560	515	6.0	–	–	–
	2nd semester	8,120	780	9.6	6,920	220	3.2	8,120	560	6.9	–	–	–

Table IV-10. Utilization of Teaching-Learning Materials for Checking Learning Progress and Feedback

Utilization of teaching-learning materials	Average		1st semester		2nd semester	
	F	%	F	%	F	%
Diagnosis test is conducted as teacher's guide suggests.	286	89.9	134	86.5	152	93.3
Preparatory learning is conducted as teachers' guide suggests	287	90.3	137	88.4	150	92.0
Learning is ascertained as teacher's guide suggests.	310	97.5	149	96.1	161	98.8
Remedial and enrichment programs are provided as teacher's guide suggests.	256	80.5	121	78.1	135	82.8
Summative evaluation is conducted as teacher's guide suggest.	286	89.9	134	86.5	152	93.3

model and minutes taken for it were figured out in terms of its percent of total hours.

As noticed above, minutes taken for checking and feedback accounted for 14 percent and nine percent of total instruction hours. Frequent checking of learning progress helped much to minimize learning deficiencies and maximize the effect of teaching and learning. Concomitantly, analysis was made of how much the teaching-learning materials were actually utilized for this performance.

The second semester shows a higher degree of utilization than the first semester. It should be noticed that the teachers not drawing on teaching materials, although accounting for a negligible proportion, can develop into a serious hindrance to enhancing the effectiveness of the new educational system. The findings of this analysis are supportive of the student opinions rated on a three-point scale. They scored 2.88 and 2.82 in first and the second semesters respectively.

E. More Opportunities for Self-Directed Learning

(Intrinsic Goal 4)

Enlarging opportunities for self-learning is the fourth of the intrinsic goals of the new educational sytem. It encourages learners to actively partake in learning activities-such as discussion, cooperative and group learning, programmed learning, problem-solving, experiment and observation and to direct one's learning without relying on others.

In order to determine the degree to which this goal was achieved, the frequency of self-learning was compared with that of conventional learning under the new educational system.

Teacher's responses to questionnaires reflect the view that the new educational system enlarges opportunities for self-directed learning. Learners were motivated to engage in learning with a high degree of spontaneity and independence. The sense of autonomy and cooperation was striking among learners. The second semester provided more opportunities for active participation than the first semester. This tendency may well be attributed to teachers deepening their understanding of the new educational system, commensurate to their accumulated experi-

Table IV-11. Teachers' Reactions to Self-directed Learning

Responses to questions	Average		1st semester		2nd semester	
	F	%	F	%	F	%
The new instructional system provides more opportunities for question and expression of ideas.	283	89.0	132	85.2	151	92.6
The new system facilitates self-learning ability.	309	97.2	149	96.1	160	98.2
The new system encourages pupils to actively participate in learning activities.	302	9.50	143	92.3	159	97.5

ences with it. Yet the achievement of this goal is relatively low as indicated by Table IV-4. In the first place, this may be due to limited budget set for the supply of teaching-learning materials. The second reason may have something to do with the insufficient support of the new school management system in dealing with over-crowded classrooms.

F. Utilization of Teaching-learning Materials and Learning Experiences

(Intrinsic Goal 5)

The fifth intrinsic goal of the new educational system is to provide for the maximum utilization of teaching-learning materials and media. In order to determine the degree to which this goal was achieved, teachers' opinions were surveyed regarding how effectively the given materials and media are utilized.

In general, it was noticed that teaching-learning materials were utilized effectively. But there seemed to be some difficulty of determining the part of instruction amenable to broadcasting media. Comparing with other goals, the achievement of this goal, when rated over a three-point scale, registered the highest points (2.87) in the second semester (see Table IV-4). The implication is that teachers came to have a fairly good command of the materials after the rigid adherence to the given instruction procedure which was typical of trial use. On the part of learners, the workbook proved more helpful than any others in ensuring their readiness for learning tasks.

G. Remedial and Enrichment Programs

(Intrinsic Goal 6)

The new educational system commends itself for catering to a wide range of individual needs by providing remedial and enrichment programs vis-a-vis a flexible grouping of learners. Analysis was made of

their impact on actual student achievement.

Table IV-12. Utilization of Teacher's Guide

Responses to questions	Total (N = 318)		1st sem. (N = 155)		2nd sem. (N = 163)	
	F	%	F	%	F	%
Given materials and media are utilized effectively	286	89.9	134	86.5	152	93.3
Broadcast programs fully utilize the characteristics of broadcasting media	186	58.5	83	53.6	103	63.2

Table IV-13. Utilization of Workbook

Responses to questions	Total (N = 991)		1st sem. (N = 397)		2nd sem. (N = 594)	
	F	%	F	%	F	%
It is better to learn with learning guide than to do without it	828	83.6	335	84.4	493	83.0
The learning guide is better than other materials	898	90.6	362	91.2	536	90.2
All problems for practices in the learning guide are solved	907	91.5	382	96.2	525	88.4

It is apparent that the new educational system provides more opportunities for remedial and enrichment programs than the conventional system. But teacher's actual teaching does not reflect the commensurate increase of those learning experiences, and this may be attributed to the

lack of their experiences with the materials. The flexible grouping of learners invoked favorable reactions of learners predicting positive impact on student achievement. The new methods such as small group learning, cooperative learning, brainstorming, etc. were considered a breakthrough giving vitality to the dry, monotonous way of learning.

Table IV-14. Teachers' Reactions to Remedial and Enrichment Programs and Classroom Organization

Responses to questions	Total (N = 318)		1st sem. (N = 155)		2nd sem. (N = 163)	
	F	%	F	%	F	%
Learning outcomes are improved through remedial and enrichment learning	195	61.3	80	51.6	115	70.6
The new instructional system provides more opportunities for remedial and enrichment programs.	290	91.2	143	92.3	147	90.2
The flexible organization of learning group creates a climate of cooperation conductive to higher achievement	270	84.9	120	78.0	150	92.0

Table IV-15. Students' Opinions about the Flexible Organization of Class

Responses to questions	Total (N = 991)		1st sem. (N = 397)		2nd sem. (N = 594)	
	F	%	F	%	F	%
It is conducive to a small-group learning	895	90.3	354	89.2	541	91.0
It facilitates inter-student learning	950	95.9	386	97.2	564	94.9

3. Evaluation of Payoff Goals

This chapter examines the extent to which the payoff goals of new educational system were achieved. Evaluation focused on the actual changes that have been made on educational scenes as the result of the new educational system in operation. The changes may be considered in terms of the impact on student achievement in cognitive and affective domains and on the competancy of teachers instruction and school management. The evaluation of cognitive achievement was based on base line data provided by the fine comprehensive tryouts. The achievement of affective domain was evaluated on the basis of reports by pilot and cooperative schools and the report by Evaluation Committee of New Educational System under the auspices of the Ministry of Education.

A. Academic Achievement

1) General Tendencies

Analysis of student achievement through the small scale and comprehensive tryouts showed an increasing tendency of higher achievement. Fig. IV-1 compares achievement between experimental and control groups. Achievement test prior to tryout revealed the entry points of the two groups; control group scored 63 points on an average, 2 points over that of experimental group. In grade 5, experimental group scored 57 points against 56 points of control group. In grade 3, experimental groups scored 59 points against 60 points of control group, suggesting that the two groups are on an equal par.

The achievement test administered upon the completion of the first comprehensive tryout yielded the following results. The achievement of experimental group averages 62 (third graders scored 63 points and fifth graders 60 points), while that of control group averages 54 points (third graders scored 58 points and fifth graders 50 points). The lower achievement of control group was consistently discernible in the following com-

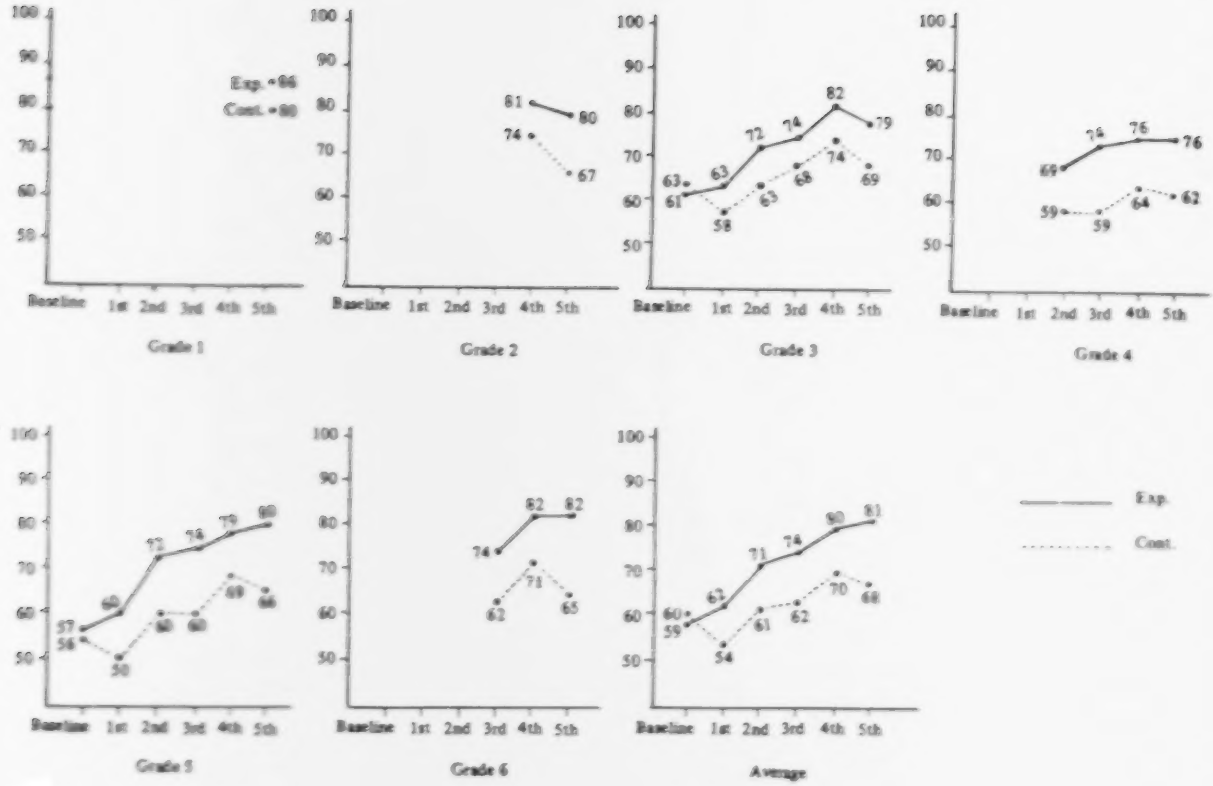


Figure IV-1. Yearly Achievement

prehensive tryouts.

Through the second comprehensive tryout, the experimental groups achieved 12 points higher than the control groups. The difference varies from six points in grade 3 to 7 points in grade 4. The same tendency was noticed in the fourth comprehensive tryout. The difference ranges from 7 points in grade 2 to 12 points in grade 4, showing an average of 10 points difference.

It is worthy of attention that even the control groups showed a steady improvement of achievement as they proceeded through tryouts. This was due to a partial influence of the new educational system which gained exposure through the transfer of teachers and KEDI's information services. The tryout itself increased consciousness that the groups were tested and this stimulated interest in the new educational system. For the fifth comprehensive tryout, an additional effort was made to select schools least affected by the new educational system.

The results of the fifth comprehensive tryout showed a difference of 6 points between the experimental and control groups in grade 1. Such minimal differences were also noticed in grades 2 and 3 through the third and fourth comprehensive tryouts. This tendency reinforces the belief that the new educational system was more effective with high grade levels. This fact may be attributed to wide individual differences of high graders in achievement, presumably resulting from learning deficiencies accumulated over many years. Low graders leave little deficiencies to be remedied by the new educational system.

It is in grade 2 and above that noticeable differences are observed between experimental and control groups. The achievement of experimental groups is 13 points higher in grade 2, 10 points higher in grade 3, 14 points higher in grade 4, 14 points higher in grade 5 and 17 points higher in grade 6. On an average, the experimental groups achieved 13 points higher than the control groups.

From the findings of numerous tryouts it is possible to advance the

following conclusions: First, the new educational system brings about a noticeable improvement of student achievement. Second, it is more effective with higher grade levels where achievement differences are attributed to accumulated learning deficiencies. Its effectiveness increases in proportion to the time length of tryout. The application of new educational system in grades 1 and 2 started with the fourth comprehensive tryout, and this accounts for its being less effective in lower grades.

2) Higher Proportion Attaining to Mastery Level

Out of the maximum scores of 100, those scoring 80 points are considered as having attained to mastery level. The proportions of pupils attaining to this mastery level are given in Figure IV-2.

In the achievement test concluding the first comprehensive tryout, the experimental group had 27 percent of total participants attaining to the mastery level,9 points higher than 16 percent of the control group. By the time the second comprehensive tryout was concluded, the proportion rose to 42 percent in the experimental group, nearly doubling the 23 percent in the control group. In the third comprehensive tryout these proportions rose to 45 percent and 20 percent respectively. The fourth comprehensive tryout registered 59 percent and 32 percent respectively. In the fifth comprehensive tryout, the former rose to an impressive 62 percent, tripling the latter's 18 percent. As they go through tryouts, there was a consistently increasing proportion of experimental group reaching the mastery level. On the other hand, the proportion of control group fluctuated, remaining at the level of 22 percent on an average. These empirical data support the belief that the new educational system is effective not only in raising student achievement but in increasing the proportion of those reaching the mastery level.

3) Higher Mental Processes

The new educational system commends itself for enriching learning

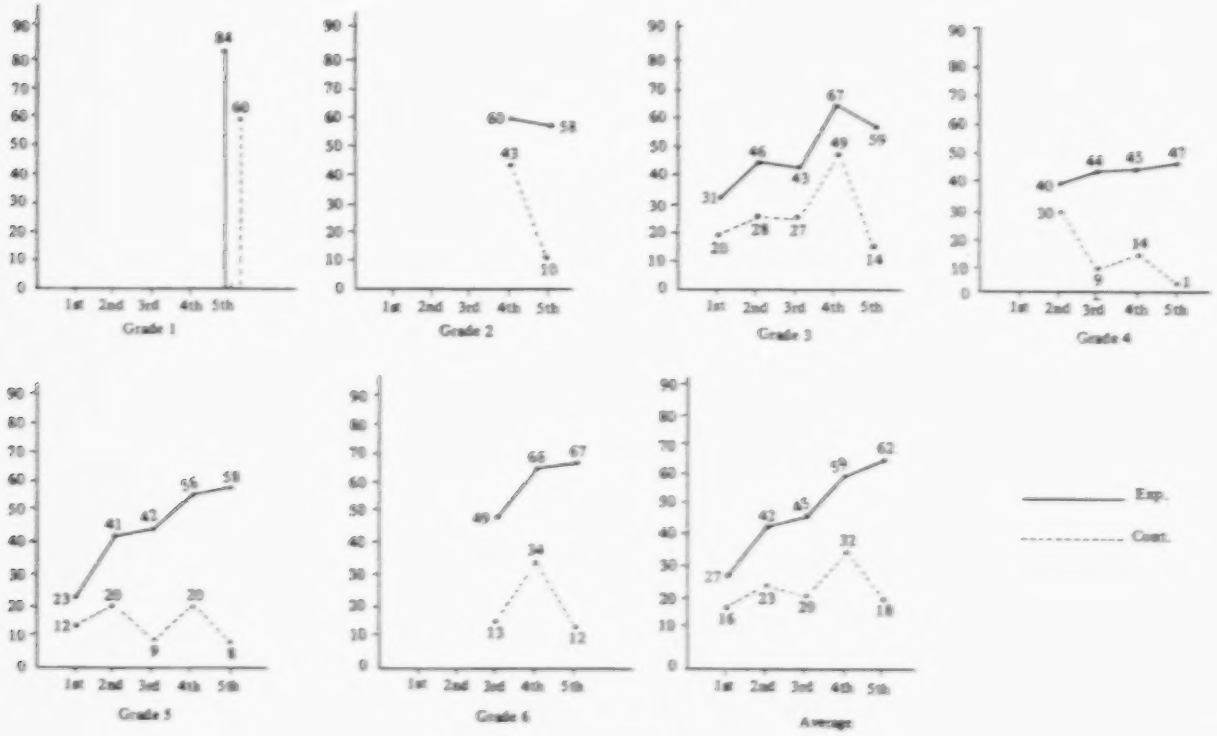


Figure IV-2. Proportions of Mastery Level

experiences conducive to the development of problem-solving, critical thinking and creativity. This intent was reflected in the development of teaching-learning materials and teacher training programs.

In research related to determining how the new educational system actually worked to serve this purpose, three methods were employed: The first one involves attempts to classify the questions of achievement test into knowledge and higher mental processing dimensions and compare correct answers between the two groups in each dimension. The second one was to use the test of basic learning skill applicable to multiple grades as a way to compare correct answers between the two groups. The third one involved an effort to trace the tryout participants to their middle schools to determine the impact of earlier exposure to the new educational system on achievement.

(1) Correct Answers in Achievement Test

Questions in achievement test were classified into two areas, knowledge and higher mental processes. In each area correct answers were compared between the two groups. Its results are discussed by taking an example of achievement test in the third comprehensive tryout.

In Table IV-16, the following facts stand out: First, the experimental group excels the control group in knowledge and higher mental processes of any subject matter. Second, grades 5 and 6 show significant differences between the two groups in understanding, inquiry and attitude that stimulate higher mental process. Significant differences are also noticed in six subject matters, namely; Korean language, social studies, science, music, fine arts and vocational subject. The time length of the new educational system in operation is an important factor for different achievement in higher mental processes. This fact is evidenced by comparing the achievement of grade 3 with that of grade 5 and 6; the former saw one year of its application, whereas the latter was exposed to it for more than two years.

Table IV-16. Achievement Test Results Following the Third Comprehensive Tryout

Subj.	Area	Grade 3				Grade 4				Grade 5				Grade 6			
		No. of items	Correct answers (%)			No. of items	Correct answers (%)			No. of items	Correct answers (%)			No. of items	Correct answers (%)		
			Exp. N=191	Cont. N=172	t		Exp. N=186	Cont. N=211	t		Exp. N=186	Cont. N=217	t		Exp. N=194	Cont. N=223	t
Moral ed.	Understanding	7	86	80	1.61	8	82	79	1.60	10	74	69	1.05	13	94	86	2.7**
	Attitude	8	90	89	2.19*	7	90	85	1.62	5	91	89	1.63	2	88	80	2.26*
Kor. Lang.	Knowledge	13	75	63	2.53*	9	81	72	2.01*	5	59	46	2.52**	9	84	64	5.44**
	Understanding	12	77	70	1.40	21	81	71	2.33*	25	74	64	2.23*	21	79	61	4.18**
Soc. St.	Knowledge	10	82	73	1.86	12	66	57	2.12*	16	71	64	1.36	8	73	62	2.30**
	Inquiry	15	71	64	1.36	18	64	52	2.33*	14	59	56	2.76	22	75	60	3.50**
Math.	Knowledge, skill	14	80	72	1.90	11	63	53	1.91	18	64	48	3.22**	10	75	64	2.45*
	Understanding	6	73	66	1.47	14	57	48	1.79	7	54	45	1.92	15	71	56	3.06**
Science	Knowledge	12	79	69	2.00*	14	73	60	2.24*	13	77	71	1.52	8	71	70	0.25
	Inquiry	13	74	69	1.01	16	71	62	1.84	17	80	67	2.95**	22	76	59	3.93**
Music	Knowledge	8	67	55	2.55*	7	63	55	1.52	6	67	55	2.39*	9	78	66	3.17**
	Expression	7	69	62	1.54	8	58	46	2.36*	9	59	48	2.20*	6	62	49	2.83**
Fine Arts	Knowledge	6	63	58	1.20*	7	53	38	3.03**	7	68	53	3.09**	8	68	50	3.64**
	Expression	9	71	58	2.63**	8	79	64	3.46**	8	77	68	2.17*	7	75	51	5.33**
Industrial Arts	Knowledge					9	63	59	1.66	12	76	61	3.39**	6	78	66	2.70**
	Application					6	77	72	1.12	3	89	80	2.63**	9	69	57	2.43*

Significance level: *=P< .05 **= P < .01

Table IV-17. Mean and Standard Deviation of the Basic Learning Skill Tests

Grade			Tests Relevant to Grade 4					Tests Relevant to Grades 4,5, and 6				
			Lang-uage	Num-ber	Use of materials	Total		Lang-uage	Num-ber	Use of materials	Total	
Grade 4	No. of Items		60	40	20	120	Percent score	110	61	30	201	Percent score
	Exp. N=365	M	41.60	32.55	15.45	89.60	74.66	72.04	42.76	21.90	136.70	68.00
		SD	10.54	4.99	3.03	13.40	11.21	19.16	7.77	4.50	23.49	11.68
	Control N=364	M	37.21	26.96	12.89	76.99	64.15	62.37	33.90	17.96	114.12	56.77
		SD	10.05	7.36	3.62	16.43	13.69	17.93	9.30	4.92	25.69	12.78
	Significance Test(F)		35.59	145.01	103.09	132.32		53.95	202.1	131.71	161.17	
Grade 5	No. of Items		90	51	25	166	Percent score	110	61	30	201	Percent score
	Exp. N=378	M	65.27	40.66	20.12	125.84	75.80	81.03	46.87	33.15	150.81	75.02
		SD	14.11	8.46	3.87	19.44	11.71	16.38	10.11	4.55	23.10	11.49
	Cont. N=363	M	57.85	35.19	18.33	110.92	66.81	71.12	40.15	20.88	131.63	65.49
		SD	15.67	10.05	4.58	22.74	13.69	18.54	11.75	5.32	27.24	13.55
	Significance Test(F)		47.38	66.10	32.74	95.40		59.89	71.81	40.36	109.4	

(2) Test of Basic Learning Skill

Basic learning skill is not limited to a particular subject; it refers to a mastery of essential requirement for learning various subjects. An instrument was developed to determine the mastery level of essential requirement.

The instrument consisted of 263 questions, each applicable to two or three grade levels. Fourth and fifth graders were asked to take the test relevant to grade 4, 5 and 6 and its results were compared between the experimental and control groups.

As noticed above fourth graders of experimental group scored 75 points in testing items relevant to grade 4, 11 points higher than the achievement of control group. In testing items relevant to grades 5 and 6 the experimental group scored 68 points, 11 points higher than that of control group.

Fifth graders of experimental group scored 76 points in testing items relevant to grades 4 and 5, nine points higher than that of control group. In testing items relevant to grade 6, the experimental group scored 75 points, 10 points higher than that of control group. These are empirical data evidencing the effectiveness of new educational system in improving basic learning skill and problem-solving ability in higher grades.

(3) Transferred Impact of New Educational System

In order to determine the long-term impact of the new educational system, children who partook in tryouts, were traced to their middle schools. This study was targeted at those who had been exposed to the new educational system for four years by the time the fourth comprehensive tryout was concluded. They were the first graders of 30 middle schools, whose achievement was compared with those of control groups.

The higher achievement of those from pilot schools than the control group well argues for the transferred effect of the new

educational system on achievement to later years, particularly in higher mental processes.

4) Reduced Disparity

(1) Regional Disparity

In 1974 when research for the new educational system was initiated, KEDI conducted the national achievement test for all primary schools across the nation. The average achievement of urban schools was 66 points, 11 points higher than that of rural schools. The achievement test conducted prior to the first comprehensive tryout revealed a difference of 11 points in favor of urban schools. This tendency was discerned in earlier tests.

Reducing regional disparity was set forth as one of the payoff goals of the new educational system. The results of achievement tests attendent to the five comprehensive tryouts provide empirical data evidencing the effectiveness of new educational system in reducing the regional disparity of achievement.

Table IV-18 Achievement at Middle School Students (After the 4th Comprehensive Demonstration)

Group	Mean score	Standard Deviation	No. of Students	T scores
Students Graduate from Exp. School	69.99	14.91	1,094	53.11
Students Graduate from non-exp. School	65.21	15.11	7,013	49.63

At the time of initiating the first comprehensive tryout, the experimental groups scored 65 points in urban schools against 53 points in rural schools, showing a difference of 12 points. The control groups showed a difference of 11 points by scoring 65 points and 54 points for urban and rural schools respectively.

After the second comprehensive tryout, both urban and rural schools showed a marked increase of achievement; the achievement of the former stood at 71 points, one point higher than the latter's. There was an increase of 17 points in the achievement of rural schools.

Throughout the following three comprehensive tryouts, the experimental groups of rural schools registered a steady increase in achievement with the resultant increase of 5-6 points over those of control groups in urban schools. The comparison of regional difference in the experimental groups with that of control groups is handicapped by the limited member of participating schools. But the data provided by the comprehensive tryouts (the second through the fifth) speak for the effectiveness of new educational system in shrinking the regional variance of achievement. The urban-rural difference of experimental groups stood at four points, half that of control groups.

(2) Diminished Individual Difference

The new educational system enlarges opportunities for self-directed learning catering to individual needs. This refers to its potential for diminishing individual differences of achievement. Following the fourth comprehensive tryout, an achievement test was conducted to examine how it worked to verify its potential (Table IV-19).

As noticed in the table, individual differences are represented by standard deviation. Taking a glance at it, the abatement of

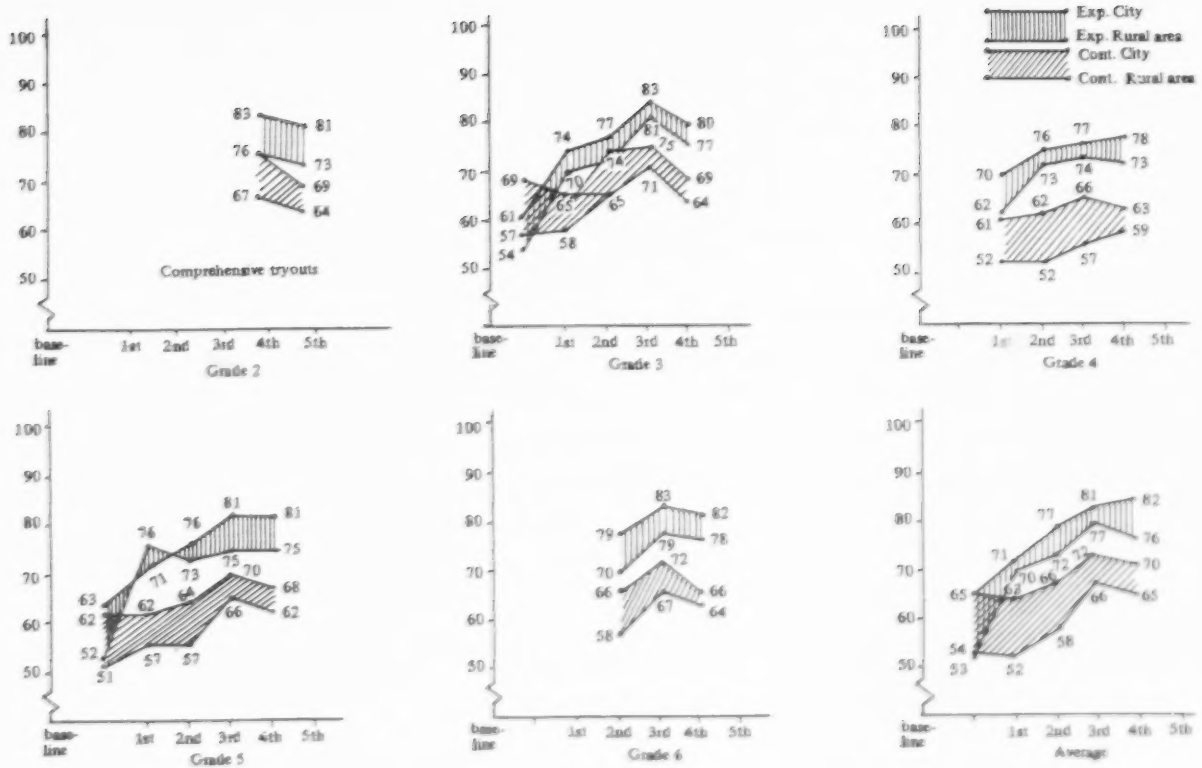


Figure IV-3. Regional Variation of Student Achievement

Table IV-19. Mean and Standard Deviation of the Achievement tests by Groups after the 4th Comprehensive Demonstration

Grade			Kor. lang.	Math.	Soc. St.	Science	Moral Ed.	Music	Fine Arts	Industrial Arts	Average
2	Exp.	M	86.33	85.49	76.99	78.79	84.14	79.08	77.33		81.18
		SD	13.45	15.16	16.64	16.10	13.48	14.31	16.13		11.34
	Cont.	M	76.95	76.52	69.04	76.97	77.19	69.29	71.20		73.83
		SD	17.43	20.26	19.10	17.76	17.26	19.11	20.57		15.14
	Difference in Mean		119***	67**	65***	5*	58***	101***	39***		99***
	Difference in Standard Deviation		1.97**	1.79**	1.32**	1.22**	1.64**	1.78**	1.63**		1.78 **
3	Exp.	M	89.33	86.55	83.84	81.45	87.52	77.56	70.04		82.36
		SD	11.61	13.65	15.32	13.23	10.74	15.58	16.87		10.48
	Cont.	M	80.73	80.40	74.06	74.30	84.67	65.82	61.93		73.76
		SD	16.15	16.66	18.43	13.82	13.31	17.90	17.30		13.50
	Difference in Mean		116***	53	99***	75***	21***	122***	75***		147***
	Difference in Standard Deviation		1.94**	1.49**	1.45**	1.09**	1.54**	1.32	1.05**		1.66**
4	Exp.	M	83.73	75.56	70.09	78.56	84.71	77.41	72.66	65.01	75.97
		SD	11.18	18.45	17.77	15.21	13.55	15.47	16.16	16.52	12.00
	Cont.	M	75.45	58.95	54.05	67 88	78.79	64.44	61.03	53.72	64.10
		SD	16.41	19.99	20.09	19,54	17.70	17.37	17.74	15.35	14.70
	Difference in Mean		104***	209***	198***	105***	39***	182***	141***	136***	227***
	Difference in Standard Deviation		2.15**	1.17**	1.28**	1.65**	1.71**	1.26**	1.21**	1.16**	1.50**

Grade			Kor. lang.	Math.	Soc. St.	Science	Moral Ed.	Music	Fine Arts	Industrial Arts	Average
5	Exp.	M	84.00	78.35	80.62	83.17	86.35	72.48	78.45	71.25	79.30
		SD	12.11	17.69	16.68	11.62	11.14	17.06	16.01	15.56	11.40
	Cont.	M	77.25	65.81	69.79	73.48	81.39	58.70	67.52	60.42	69.23
		SD	13.48	19.94	18.11	14.38	13.41	19.17	16.55	16.13	12.59
	Difference in Mean		79**	121***	102***	138**	41**	155***	53***	122***	181***
	Difference in Standard Deviation		1.24**	1.26**	1.18**	1.53**	1.45**	1.26**	1.07**	1.07**	1.22**
6	Exp.	M	38.84	84.96	87.40	78.36	87.65	84.21	77.31	73.35	82.01
		SD	10.89	17.00	12.02	12.24	8.94	16.33	15.78	16.11	10.54
	Cont.	M	73.38	73.30	76.09	68.97	83.06	67.04	62.69	65.23	71.18
		SD	13.94	13.26	18.62	15.78	13.13	22.31	17.39	17.65	13.60
	Difference in Mean		216***	188***	138***	122***	40***	224***	250***	68***	248***
	Difference in Standard Deviation		1.64**	1.65**	2.40**	1.66**	2.16**	1.87**	1.21**	1.20**	1.66**

*P < .05 ** P < .01 ***P < .001

individual differences is striking in the experimental groups in all grades and subjects, except for science of grade 3. Despite the earlier fact that the experimental groups achieved 10 points higher than the control groups, the former registered a relatively minimal standard deviation, amply verifying the potential of new educational system in diminishing individual differences.

(3) Variation of Achievement Between Classes and Subjects

Table IV-20 summarizes the opinions of teachers in experimental schools as to how the new educational system worked to diminish the variation of achievement between classes and subjects.

Questioned about its effectiveness in this respect, 85 percent of teachers responded positively in support of the new educational system. On the basis of empirical data, an optimistic view is prevailing about its potential for eliminating human factors causing achievement differences and standardizing the quality of instruction.

B. Affective Domain

1) Self-Directed Learning

The cultivation of self-directed learning is one of the intrinsic goals set for the new educational system. The workbook is its essential ingredient intended to encourage self-directed learning, and the instructional model emphasizes inquiry through experiments, investigation, practice and team approach.

Throughout the five comprehensive tryouts, there has been a consistently increasing tendency of self-directed learning. Opinions of teachers surveyed in the fourth and fifth comprehensive tryouts are indicative of a wide gap in the provision of self-directed learning experiences between the experimental and control groups. 75 percent of experimental teachers responded "more than half the learners are motivated to solve

Table IV-20. Diminishing Effects in the Achievement Difference

(N = 47)

Descriptions	Wider than before		Same		Little diminished		Much diminished	
	F	%	F	%	F	%	F	%
1. Difference among Subjects	3	6	3	6	18	38	23	49
2. Difference between general and arts subjects	4	9	2	4	18	38	23	48
3. Difference between arts subjects	2	4	4	9	12	26	29	62
4. Difference between Classes	1	2	3	6	15	31	28	60

problems for themselves", whereas those giving positive responses in control schools accounted for 35 percent of total respondents. Those stating "more than half the group members motivated for self-directed learning without homework" accounted for 48 percent of total respondents, whereas this proportion stood at 23 percent in the control group. Out of 39 experimental school teachers surveyed, 34 (87 percent) responded "those previewing and reviewing lessons increased in number" and the same proportion of teachers responded "there are more children free to ask questions". This finding is consistently echoed by the report of Evaluation Committee of New Education System under the auspices of the Ministry of Education and other reports by experimental and cooperative schools. The Ministry of Education's Report states; "the intention to do self-directed learning was high among children under the new educational system and children-directed learning dominated the total process of instruction with their spontaneous engaging in learning activities".

2) Improved Ability to Express Opinions

Emphasis on learning experiences conducive to problem-solving, critical thinking and creativity was characteristic of the new educational system. As a result, learners improved their ability to voice opinions and report findings to share with others. This finding was included in the report on the fifth comprehensive tryout.

A survey was conducted for 12 schools-equally divided into experimental and control groups-in a 72-hour instruction of social studies with a view to revealing a gap between the two groups in the opportunity to express ideas and report findings. It was noticed that children of the experimental group were more vocal of ideas and findings particularly in topics related to

higher mental processes. The question and answer session reportedly lasted 40 minutes, accounting for 50 percent of the total session in the experimental group. This proportion represented 40 percent of total instruction in the control group. Consequently, children of the experimental group improved the logics of speaking and communication skills.

Backun Primary School in Daejon used Flander's language interaction model for an analysis of question-answer process in March and September. Teacher's lecture which took 51.5 percent of total instruction in March diminished to 8.4 percent in September: Reversely, the proportion of learners vocal reactions increased from 0.4 percent to 32 percent.

The report by the Evaluation Committee endorsed this finding by highlighting the improved ability of learners to express ideas. Chonyong Primary School reported on the contrasted findings of two surveys in early March and late May; learners vocal reactions in the former were dominated by a few of excellent children but they gave way to mediocre children later as the new educational system invoked a more active participation of learners in learning process.

3) Self-Confidence

The new educational system itself does not provide experiences related to the development of a particular affective attribute. But its contribution to higher achievement caused learners to be more conscious of oneself, thus nurturing a poisitive sense of one's ability. The fourth and fifth comprehensive tryouts reported that the new educational system did more than its share in developing self-confidence among learners. According to the findings of the Fourth Comprehensive tryout, 66 percent of experimental school teachers were of the opinion that more than half the learners were confident of their ability to improve-

ment achievement. This proportion went down to 37 percent in control group. The report on the fifth comprehensive tryout stated that there was a considerable increase in the number of children confident of learning. 36 teachers out of 39 in experimental schools were of this opinion. The report by the Evaluation Committee stressed the importance of supplementary programs in remedying learning deficiencies and providing motivation coming from new confidence. The pilot and cooperative schools reported similar findings; In Yesung Primary School 57 percent of fifth graders were reported confident of learning in March, and it rose to 73 percent in October.

4) Interest in Learning

Although the new educational system was not intently purported to make learning itself amusing, it can be inferred that higher achievement causes one to feel interest in learning.

The reports on the fourth and fifth comprehensive tryouts stated that 45 percent of teachers in experimental schools responded to more than 70 percent of children interested in learning. In the case of control schools, the proportion dropped to 16 percent.

In a questionnaire survey, 90 percent of teacher respondents in the experimental schools answered that those interested in learning increased in number under the new educational system. Reports by experimental and cooperative schools provided consistent data in support of this finding. Daesung Primary School reported a significant difference in the proportion of children interested in learning during the time span between the fourth and fifth comprehensive tryouts; 41 percent registered in the former increased to 57 pecent in the latter.

In Seo Primary School, 36 percent of children responded "feel interested in learning" at the time of the second compre-

hensive tryout and this proportion rose to 54 percent by the time the third comprehensive tryout was concluded.

5) Cooperation Among Classmates

The new educational system encourages team approach based on cooperation among its members. The second, third and fourth comprehensive tryouts were unanimous in speaking for the team approach as a means of nurturing an attitude toward helping one another.

The merit of new educational system is described by citing an example of survey findings by Buk Primary School. Those showing positive reactions to "cooperative learning is better" accounted for 87 percent of total respondents (1,186). 64 percent responded to "help others simply out of intention to help them". 72 percent felt a sense of satisfaction after helping others. 67 percent were of the view that cooperative learning finds them in a close friendship. Cooperative learning relies on a smooth flow of communication among the group members, whereby each feels a sense of pleasure and satisfaction from serving for or being served by others. Cooperative learning in this sense is the source of mutual trust which guides one into a humane character and greater consciousness of community life.

The report by the Evaluation Committee and those by experimental and cooperative schools are one in advocating the cooperative learning.

C. Changes in School Management

1) Rationalization of School Management

The new school management model attempts to rationalize the management of school affairs by articulating two sets of goals-education and management, by managing school affiars in a consistent way dictated by the goals, by evaluating the achievement of goals and feeding back

findings for remedying deficiencies. The new educational system introduced the concept of "management by objectives" to the schools which were devoid of goals.

Another concept realized in schools was grade-centered management which required a collective participation of all teachers of the same grade level in planning and implementing managerial affairs related to the grade. The collective participation of teachers heightens a sense of joint responsibility for managing the grade as well as offering the advantage of pooling resources on a cooperative basis. It encourages teachers to manage in full view of objectives and evaluate progress against them.

According to the report on the fifth comprehensive tryout, 93 percent of teachers in pilot schools commended the new ways of managing in accordance with objectives as a viable alternative to the present system. The Evaluation Committee endorsed the school management model as a breakthrough to systematize the ways of managing school.

Regarding the merits of school management model, a survey was conducted to elucidate opinions of principals, assistant principals, teachers, supervisors and researchers. 92 percent of total respondents stated that it helped a lot to rationalize the operation of curriculum. This finding is consistent with the report on the fourth comprehensive tryout-that 87 percent of teacher respondents advocated the school management model for its contribution to deepening an understanding of school education by goals-that articulating goals ensures a successful implementation of them.

2) Operation of Curriculum

The teacher's guide has concepts and methodologies specified within the framework of curriculum. Adherence to the teacher's guide for instruction is the way to ensure a normal operation of curriculum.

The school management model encourages a pooling of resources and ideas to bear on the planning of instruction. Cooperative mood is built, inviting a frequent holding of meetings, whereby progress of learn-

ing is coordinated, ideas are shared and problems are tackled in a collaborative attempt. Hence, it enables teachers to make a thorough plan of instruction. Essential to a normal operation of curriculum is scheduling instructions of subjects on valid criteria. The built-in mechanism which stirs individual teachers to a collaborative effort and the sense of joint responsibility tides over the difficulty of such a task.

According to the report on the fifth comprehensive tryout, all of pilot school teachers commended the school management model for its contribution to a normal operation of curriculum. Particularly, the departmentalization of arts subjects and physical education should be noted for its contribution to a normal operation of these subjects. Previously, they were overlooked as peripheral subjects, and the limited number of teachers versatile with such subjects was an additional hindrance to a normal operation of curriculum. As a consequence of the school management model in operation, there was a significant change of teacher's attitude toward giving top priority to a normal operation of curriculum.

Buk Primary School, Cheju Do, reported on the merits of adhering to teacher's guide and workbook in effecting a normal operation of curriculum. Remedying learning deficiencies before proceeding further was accepted as an essential step to be taken in the process of instruction.

3) More Opportunities for Teacher's Participation

An effective achievement of goals necessitates the widest possible representation of concerned personnel in decision-making process related to planning, implementation and evaluation. It enriches the repertory of ideas and approximates to the best solution. The strength of school management model lies in its drawing on a collaborative and cooperative attempts of teachers to face up managerial problems. It was from this concern that a grade-centered management was institutionalized, whereby teachers actively engage in matters pertaining to school management.

Upon the conclusion of the fifth comprehensive tryout, teachers'

opinions were surveyed regarding the effectiveness of school management model. 90 percent of total teacher respondents found its virtue in enlarging the opportunity for teachers to participate in managerial works. 86 percent commended it for binding teachers in a cooperative human relationship.

Dong Kwang Primary School, Kimhae, reported on the school management model that it produced cooperative mood among teachers, as its decision-making process is open to their views. The cooperative mood is not limited to teachers but extends to the relations between teachers and administrators and between grade levels as well as between classes. The report by the Evaluation Committee reflects similar comments on the school management model.

4) Teacher's Workload

The cooperative and joint undertaking called for by the school management model denotes a division of labor on the basis of one's specialty. It allows teachers to lustily devote himself to the subjects in which he excels others. The results of one's study are brought to a joint meeting where they are open to views of others. The specialization of task was reportedly helpful in reducing teacher's workload. According to the report on the fourth comprehensive tryout, 69 percent of principals in pilot schools were in favor of the school management model in this respect.

Yesung Primary School, Chung Joo, cited four factors for a reduced workload of teacher. First, using teacher's guide saves a teacher the time and effort to search for reference materials. Second, the departmentalization of arts subjects and physical education allows teacher to focus on the subject he is well versed in. Third, by relying on evaluation materials in the teacher's guide, teacher is saved from time-consuming works such as test development and writing on the blackboard. Fourth, cooperative instruction for retarded learners does away with the inefficiency of doing it alone. The grade-centered management minimizes the

chance for varying quality of education among classes, characteristic of self-contained classroom. It helps a lot to equalize the quality of instruction and eliminate psychological stress resulting from unnecessary competition between classes.

The report by the Evaluation Committee hailed the school management model as a breakthrough to liberate teachers from an ever-increasing work-load.

D. Quality of Teachers

The new educational system consists of such components as general instruction model, instructional model for subject, school management model and teaching-learning materials. These components reflect up-to-date theories of knowledge and instruction. Prior to the actual application of the components teacher trainings varying in kind and duration were conducted to get teachers to be acquainted with the new educational system. At the school level, encouragement and support were given to self-sponsored training and meetings with a view to providing maximum exposure of the new education system. The result of trainings was a tangible improvement of teacher's competency to instruct pupils in a way toward reducing individual differences.

1) Instruction of Subject Matters

Through the first-hand experience with the new educational system during the comprehensive tryout, teachers became well versed with inquiry approach as called for by the new curriculum. By improving their competency of teaching, they were able to upgrade the quality of instruction in all subject matters and derive a sense of satisfaction therefrom. The new educational system should be noted for enhancing the quality of instruction in arts subjects and physical education which were given minimal place in curriculum. Instruction planning was facilitated by departmentalization in these subjects.

2) Equalization of Teaching Competency

The departmentalization of special subjects and grade-centered approach to instruction planning and material preparation had an equalizing effect on teaching competency. Joint meetings brought the benefits of collaborative venture to bear on the process of preparing for instruction.

The survey of teacher's opinions during the first comprehensive tryout revealed the tendency of reducing individual differences in teaching competency. Particularly, the new educational system proved much helpful to new teachers with two or three years of experience. Daily meeting of teachers brought them opportunities to remedy their defects in light of other's models and gain new insights in approaching instructional planning. Daily contact with senior teachers prompted a continuing effort for self-improvement.

The report on the fifth comprehensive tryout stated that 97 percent of pilot school teachers recognized the effectiveness of school management model in equalizing the competency of teachers. This assertion is echoed by the report of the Evaluation Committee and Seo Primary School, Anyang.

V. CONCLUSION AND PROSPECTS

The primary purpose of Elementary-Middle School Development Project was to develop a new educational system that provides quality education and solutions to a host of problems presently facing Korean education. This project is unrivalled in the scope of participation and the time involved. The magnitude of works related to research and development was staggering; the goals of elementary and middle school education were redefined, contents updated, teaching methods improved, teaching-learning materials prepared, school management rationalized and broadcasting media utilized for the process of instruction. Over the span of eight years, the new educational system was tried out by nearly 2,500 schools. Its tryouts were concluded by 1981 for grades 1, 2 and 3 and by 1982 for grades 4, 5 and 6 in time for the use of new textbooks. Tryouts were timed to be coordinated with the preparation of new textbooks under a single purview. This made it possible to prepare reflecting the intent of new educational system, thus facilitating its nationwide implementation. The upgrading of education quality and departmentalization of special subjects were in line with the emphasis of educational policy and mark a gigantic stride forward in educational innovations. Thanks to research for new teaching methods, studies regarding the instruction of subject matters will gain momentum. As TV and radio programs receives emphasis as an intergral part of instruction, the use of broadcasting media in education are becoming universal; particularly, its potential will be dramatized in out-of-school education. And the timely advent of the new media is more than significant specially when the new concept of life-long education is gaining force.

1. Contribution to New Textbooks

A series of tryouts on a small and comprehensive scales were per-

formed to vindicate the effectiveness and feasibility of new educational system. All preparatory works had been concluded for its nationwide diffusion in time for new textbooks reaching classrooms effective in 1982 (grade 1, 2 and 3) and 1983 (grade 4, 5 and 6). The new educational system had been used by over 2000 pilot and cooperative schools by that time.

The development of teaching-learning materials for comprehensive tryout paralleled curriculum development under a single purview. In 1977, the Ministry of Education designated KEDI as the national curriculum development center and commissioned the latter to develop new curricula and textbooks in accordance with emerging needs. This institutional realignment made it possible to reflect in the teaching-learning materials the intent and new emphasis of the revised curricula. With the incorporation of new roles as the curriculum development center, KEDI developed into the national center for educational research and development.

The first two years following the institutional realignment (1977 and 1978) were devoted to the preparation of textbooks for middle schools. For the next two years curricula were developed for kindergarten, primary school, middle school and high school (including vocational high school). In 1980 and 1981, textbooks of primary schools covering all subject matters were prepared to be used in 1982 and 1983.

The development of curriculum followed the procedure adopted for the Elementary-Middle School Development Project, starting with redefining of goals followed by specification of concepts and methods, and development of evaluation materials. Analysis along this procedure produced the basis for organizing the contents of textbooks, teacher's guide and workbook.

Defining the roles of textbook provides the framework of contents to be included therein. Its roles were defined as 1) providing motivation for learning, 2) presenting concepts to be learned, 3) guiding the proceeding of instruction, 4) presenting information and reference materi-

als, and 5) presenting excercises. In addition to contents dictated by these roles, the new textbooks reflect some characteristics of workbook by including objectives, reference to previous learning, formative tests and summary. Contents were organized so as to place emphasis on learning methods uniquely relevant to each subject, such as inquiry, expression of ideas, action-oriented learning, etc. Table V-2 compares the

Table V-1. Comparison with New Textbook and Instructional Materials Used in KEDI'S New Educational System

New Textbook	Instructional Model	Workbook	Remarks
* Relating to prerequisite learning	* Diagnosis test, Supplementary learning	* Diagnosis test * Preparatory learning	* by unit
* presentation of object * Awareness of problems * Major facts and principles * Learning methods and procedure * Application and generalization * Summary	* Teaching and learning * Contents are same with those of New Textbook and follows the procedures of instructional model by subjects	* Presentation of Learning tasks (including objectives) * Program organized according to the inst. model – Exercises – Information materials – Application and generalization – Summary	
* Exercises and experiments * Supplementary learning	* Extention stage Formative test → Supplementary and enrichment programs	* Formative test * Supplementary and enrichment programs	* Once for 3-4 classes

Table V-2. Comparison with Workbook and New Textbook

Sub.	Workbook	New Textbook	Notes
Korean language	• Exercises by class hour presented	• Exercises occupy 8-10 pages. Serving the purpose of workbook	• Old textbook assigned two pages for exercises
Social Studies	• Exercises • Exercises calls for action surveys • Supplementary materials for textbook • Summary	• Exercises • Those of action surveys presented at the end of a unit • Study cases included as much as possible • Summary	• Objectives presented on the top of a unit in both • Both emphasises inquiry • Both guides instruction along case study
Math.	• Diagnosis test • Contents to be taught • Exercises • Formative test and enrichment program • Preparatory learning → Major Teaching-Learning →	• Diagnosis test • Contents to be taught • Exercises • Review • Preparatory learning → learning → exercises → Review	• Workbook presents information on using it • Workbook includes more pictorial descriptions to motivate self learning • Workbook presents exercises in larger number and logical sequence

Sub.	Workbook	Note Textbook	Notes
Math.	exercises → formative test → Enrichment program		• Enrichment program is included in workbook alone • The exercises and review of new textbooks serve the purpose of formative test and enrichment programs in the workbook • The new textbooks explicitly reflect the five stages of instruction model
Science	• Diagnosis test • Objectives • Introduction to materials needed • Formative test • Enrichment program	• Preparatory learning • Major teaching-learning • Formative test follows the unit	• Workbook explicitly presents the five stages of instruction model • New textbooks allows learners to follows the five stages without distinction • Both attach importance to inquiry learning

new textbook with workbook in structure.

The modification of textbooks necessitates the development of "instruction guide" for teachers, which was intended to familiarize teachers with the intent and emphasis of new textbooks and how to guide instruction. It is the outgrowth of more elaborated teacher's guide. Both are the same in serving the following functions: 1) presenting characteristics of a subject matter, 2) articulating unit and instructional objectives, 3) annotating the contents of textbook, 4) presenting teaching-learning procedure and methods by characteristic of a subject, and 5) presenting reference materials. Table V-3 compares the two materials in structure.

Table V-3. Comparison with Teacher's Guide and Instruction Guide in Social Studies

Teacher's Guide	Instruction Guide	Notes
General	General	
1. Characteristics of social studies	1. Characteristics of social studies	
2. Basic principles of curriculum revision and textbook development	2. Objectives and concepts of social studies	
3. General objectives of social studies	3. Basic principles of textbook development	
4. Grade objectives and concepts	4. Principles of instruction in social studies	
5. Characteristics of teaching-learning materials	5. Guide to using textbook and instruction guide	
6. Basic principles of material development	6. Yearly instruction schedule	
7. Yearly instruction schedule		
Practical Instruction	Practical Instruction	
1. Overview of unit	1. Overview of unit	– Instruction plan in the latter includes annotation of contents
2. Task analysis	2. Unit objectives	
3. Unit objectives	3. Instruction plan	
4. Developmental plan		
Diagnosis test and preparatory learning in the first class hour	Preparatory learning and unit learning in the first chass hour	– The latter excludes diagnosis test
Second class hour and afterword (teaching & learning)	Second classhour and afterwords (teaching & learning)	
(1) Instructional Objectives	(1) Instructional objectives	
(2) Materials needed	(2) Materials needed	
(3) Teaching	(3) National ethics education	
(4) Points for attention	(4) Main concepts to be taught	
(5) References	(5) Instruction	
	(6) Points for attention	
	(7) References	
Formative test	Formative test	
Summative test	Summative test	

A study was conducted to determine the degree to which the instruction guide reflects activities required at each stage of instruction model. Its results are shown in Table V-4.

Table V-4. Instruction Model Reflected in Instruction Guide [1)]

Stages	Contents	Moral	Kor. lang.	Social sc.	Math.	Science	Phy. ed.	Music	Fine arts	Daily Life	Inquiring Life	Pleasant Life	We are the First Graders
Planning	1) Unit Overview	O	O	O	O	O	O	O	O	O	O	O	O
	2) Task analysis			O	O	O	O		O	O	O	O	O
	3) Unit objectives			O	O	O	O		O	O	O	O	
	4) Teaching plan	O	O	O	O	O	O	O	O	O	O	O	O
	5) Presentation of Basic materials	O			O	O	O	O	O		O	O	O
Diagnosis	1) Diagnostic test			O	O								
	2) Remedial learning				O						O		
Extended Learning	1) Formative test			O	O	O			O	O			O
	2) Supplementary learning				O	O			O		O	O	
	3) Enrichment learning				O	O			O		O		

1) KEDI. Data for Consultation on Elementary-Middle School Development Project, Unpublished, 1981.

The trial application of instructional model, teacher's guide and workbook produced three-fold effects. In the first place, KEDI researchers, through involvement in the successive implementation of tryouts over five years, became well versed with educational scenes and sharpened the practical edge of the theoretical models. The second effect can be found in the fact that the teachers experienced with the new models increased sharply in number with the resultant development of a powerful leverage for a nationwide diffusion of them. The third effect was produced by the Government policy to reorganize the structural base of curriculum development, which designated KEDI as curriculum development center. The implementation of successive tryouts concurrently with the development of curriculum made it possible to reflect all the virtues of new models in new textbooks and instructional materials. The Elementary-Middle School Development Project was complementary to the development of curriculum and textbooks; the effectiveness of new educational system was multiplied as it was infused into new textbooks and instructional guide. By and large, it can be safely stated that the new educational system is now in operation at all primary and middle schools.

2. Contribution to Classroom Instruction

It was in the classroom instruction that an immediate impact of the new educational system was felt. In the first place, the new educational system is noted for holding a promise of better education in the future. It inspired teachers whose hopes were thwarted by overcrowded classroom, lack of competency, poverty of learning materials and inadequate facilities for practice. The successful implementation of Elementary-Middle School Development Project bears testimony to the fact that it is possible to improve education quality in a crisis situation.

Second, the confidence of a possible improvement of education quality provided additional impetus to research and development acti-

vities directed toward educational innovations. The provincial boards of education and local education offices sponsored teacher trainings and seminars to disseminate the innovative system in cooperation with pilot schools serving as the rally point for educational innovations. These schools acted as the generous host of demonstrative instructions and seminars-more than twice a year. In addition, they served as the information center for the new educational system; It is through this center that all teaching-learning materials are distributed, collected and redistributed to schools without access to such materials.

Third, the new educational system made significant contribution to improving the professional competency of supervisors. Trainings, seminars and publications were one in deepening their understanding of the new educational system.

3. Impact on Educational Policy

The impact that research for a new educational system exerted on educational administration and policy is not negligible. Curriculum and textbook occupy a greater part of educational policy, in view of their importance as the pace-setter of education. Therefore, the impact of research experiences on curriculum and textbooks merits special attention. Research for a new educational system involved an enormous amount of works and investment; it took three years of research and development and five years of tryouts. Through the firsthand experience with this monumental task, participants drew valuable lessons and theories that were of practical use to the forth coming research and development activities. The immediate impact of his experience is felt on the development of curriculum and textbooks.

Of particular interest is the teaching-learning theory which is concretely manifested in the instructional model of new educational system. This model is fully reflected in the instructional guide. Further developed from this model is instructional model for subject, which suggest

teaching methods characteristic of a subject matter.

The influence of teaching-learning theory is not limited to the aforementioned teaching materials. It provided a motive for another set of innovations. Namely; (1) the subjects of lower grades of primary school were merged into an integrated form; (2) orientation program was developed for the first graders of primary school, which facilitates the shift of life from home to school; (3) new textbooks were designed to bring home the process of learning instead of concepts to be taught; (4) the structure of textbook for lower grades was renovated; and (5) the development of instruction guide was made mandatory by policy.

Among others, the departmentalization of arts subjects and physical education should be singled out as leaving the most profound impact. Before this study, there had been a good deal of attempts to departmentalize special subjects. But these attempts were made by adding able teaching staff at some private schools endowed with better conditions, and the result was a limited applicability of this system. But KEDI's system commends itself for being universally applicable under the present conditions. Thanks to its advent, it was possible to ensure a normal operation of curriculum. Since 1979, the Ministry of Education selected demonstration schools and have given encouragement and support to their trial application of this system. That this system gained prevalence bears testimony to the impact of KEDI's innovative undertaking on educational policy.

4. Contribution to Theory Building Regarding the Instruction of Subject Matters

In actuality, education at school is offered through subject matters. Despite its importance, education of subject matters remained an arid land sterilized by the apathy of educators and scholars. For its backwardness several reasons may be cited. Among others, the most compelling reason was that subject education per se seemingly does not qualify itself for indepth study.

It was the timely advent of new educational system that gave momentum to research for theories related to the instruction of subject matters, with the consequent development of instructional model for each subject. According to this model, objectives were redefined, concepts sequenced in a logical order and teaching methods relevant to each subject specified. Doing these paves the way to the development of teacher's guide, workbook, TV and radio programs. All of these new developments augur well for the future of subject matter education. It is high time to pay greater attention to this area in a way that strikes a balance between subject matters and educational theory in general. Too much emphasis on educational theories will result in a theory without substance. Conversely, engrossment in subject matter will lose sight of direction. An optimal blend of the two provides clue as to what and how to teach and how to evaluate.

5. Impact on Educational Broadcasting

The first attempt to use radio for educational purposes was made by Westinghouse in 1920 and it was made possible by establishing a broadcasting center at the University of Wisconsin in 1921. Since then, radio received a growing recognition as a medium of instruction, and more studies followed to dramatize its potential in education. In England and Germany, radio was put into use at school in 1924, and other countries followed this suit.

The genesis of using TV for education was the opening of TV station by BBC in 1936. But the opening of educational television stations was of recent origin, dating back to 1952 when FCC (Federal Communication Commission) assigned 242 channels to education exclusively. With the advance of educational technology in the 1960's, the use of TV gained prevalence in every section of education and approaches to its use are rich in variety.

In Korea, radio broadcasting was introduced in 1929 and its use for education was started with the opening of "school radio" in 1951. This program was discontinued and resumed in 1956. The effort to use radio for school program was intensified with the establishment of Audio-visual Center in 1963. The school radio program was transferred to KEDI in 1975, as Audio-visual Center was incorporated into National Institute of Education Research.

On the other hand, KEDI promotion acts were passed by the National Assembly in 1973, and the enforcement law under the acts provided the legal basis for the establishment of educational broadcasting station within KEDI. In connection with the development of a new educational system, KEDI developed ITV and IR programs, the effectiveness of which was vindicated in the four small scale tryouts from 1973 to 1975. Following the conclusion of tryouts, KEDI planned to air ITV and IR programs to the pilot schools, and the plan was not brought to reality because of the technical failure of TCOM.

Public demand for educational broadcasting continued to increase, with the resultant opening of "educational broadcasting for high schools" in September 1980. KBS (Korean Broadcasting System) assigned channel 3 to educational programs.

The use of broadcasting media in the educational process was the basic intent of the new educational system. Now, their applicability is no longer limited to school education; they have become an essential ingredient of out-of-school education. Radio is used as an expedient means to air and correspondence education, teacher education and civic education aimed at adults.

The future of educational broadcasting is bright; there will be a strong endorsement of the public for its application to educational process. Broadcast programs will be diversified in kind with an increasing number of target audience and program quality will be upgraded.

Appendix

1. Examples of Teacher's Guide and Student's Workbook, Concerning a Class Instruction of a unit of Social Studies for Grade 5 (Second Semester)

2 The Elementary-Middle School Development Project
– Paul H. Masoner –

1. Examples of Teacher's Guide and Student's Workbook, Concerning a Class Instruction of a unit of Social Studies for Grade 5 (Second Semester)

1. Teacher's Guide (11th Class)

Peninsular Countries

Textbook pp.111-112

Learning Task: Study and discuss the natural environments and industries of the peninsular countries in Europe.

1. Instructional Objectives

Knowledge - Investigate the industries of Scandinavian countries and peninsular countries in the Mediterranean in relation to their natural environments.

Inquiry Skills - Derive concrete data evidencing that the industry is closely related with natural environments and make conclusions about the relationship.

Basic Skills - Perceive natural environments and life patterns of peninsular countries in Scandinavia and the Mediterranean through maps, photographs and pictures.

Preparations
- Map of Europe
- Photo pictures of Scandinavian 3 countries and peninsular countries in the Mediterranean.
- Pictures of historical relics in Rome and Greece
- Pictures of needle-leaf trees

2. Instructional Development

Processes & Time (minutes)	Major Contents and Teaching-Learning Activities	Note
7	o Locate major peninsulas and countries therein on the map. - Locate the following peninsulas and countries on page 26 of the attached map of Social Studies (Workbook No. 1) - Peninsulas: Scandinavia, Balkan, Italy, Iberia - Countries: Norway, Sweden, Finland, Spain, Portugal, Greece and Italy	
8 Orientation	o Derive the relationship between natural environments and industries from the observations of typical industries in Scandinavia. • Judging from the typical industries linked to the abundant resources such as needle-leaf trees, conclusions can be made as follows: - Climate: Frigid Zone, Topography: Mountainous, Industry: Forestry	• The principle that the natural environment determines the types of applies to all countries.

Hypothesis	• Make hypothesis on the relationship between natural environment and industries; namely - What is the relationship of forestry industry with the natural environment of Scandinavia? (Workbook No. 2) - What is the relationship of industry with natural environment?	This generalization is drawn from the examples of the peninsular countries in Europe.
Inquiry	• Imagine industries of other regions from their environmental characteristics as shown on the map - What other industries can be developed in Scandinavia except for forestry? – What industries are typical of the Mediterranean countries?	• Although the contents regarding the characteristics of cities in various countries on page 112 of the textbook have little relevance to this principle, it is necessary to give a sketchy treatment. (Prosperous pictures of Spain and Portugal, Vatican City, Athenes and historical relics in Greece)
Evidence 20	o Present evidences supporting the close relationship between natural environment and industry. • Study and discuss the natural environments and industries of the following countries in consultation with the textbook (p.111) and workbook materials (No. 7-11) (Workbook No. 3)	
Definition	– Norway: Mountains and coastline in the frigid zone make for the development of forestry and fishery industries – Sweden: Mountains and coastline in the frigid zone make for the development of forestry, paper manufacturing and shipbuilding industries – Finland: Mountains and coastline in the frigid zone make for the development of forestry industry – Spain, Portugal: Mediterranean climate gives advantage to agriculture – Italy: Manufacturing industry and agriculture flourish because of abundant hydroelectric power generated in the Alps. – Greece: Highland near the Mediterranean are adequate to agriculture, live stock maritime industries	
Generalization 5	o Make conclusion about the relationship between natural environment and industry. (Workbook No. 4) • Direct learners to generalize that the industries are closely related with the natural environment through the example of Scandinavia.	

3. References: No. 9, 10 and 11 on page 67 and 68 of this book.

2. Workbook

(11th Class)

Peninsular Countries

Textbook pp. 111-112

Date _____

Learning Task: What are the natural environment of peninsular countries in Europe and their industries?

1. Write the names of peninsulas and countries therein on the following map.

2. Write why forestry and the paper industries are well developed in Scandinavia peninsula.

_____

_____

3. Write about the natural environments and industries of the following countries.

a.

Name of country	Industry	Natural environment
Norway	example forestry fishing	
Sweden		
Finland		
b. Spain		
Portugal		
Italy		
Greece		

4. Judging from the above facts, answer what is most closely related with the industry?
   - The industry is closely related with ( ).

Forest Industry in Scandinavia

In Scandinavian peninsula, industries based on needle-leaf trees have developed.

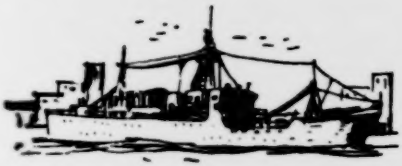
5. Natural Environment

Scandinavian peninsula lies north of 60th parallel near the Arctic circle. It has a long winter and little sunshine on account of it. Its land is mountainous and studded with many lakes, traces of glacies which had covered the peninsula. There are several small harbors along the Norwegian coastline.

6. Olive Field along the mediterranean coastline

7. Natural Environment and Industry in Norway

Due to its proximity to the fishing ground of the North-east Atlantic and with limited arable land, the Norwegians from earlier times took resort to fishery, and whale catching in particular became a popular source of resources. Maritime industry is one of major industries with long history. Lumbers are produced in abundance from needle leaf trees.



8. Natural Environment and Industry in Sweden

Sweden, located in the frigid zone, not only produces lumbers in abundance, but has developed wood pulp and ship-building industry because it is rich in forest resources and hydropower. The vast plain in the southern part made for advanced development of agriculture than in Norway and Finland.

9. Natural Environment and Industry in Finland

Finland is the "land of lake," two-thirds of which is covered with needle-leaf trees. Most of lumbers and wood pulps produced here are exported.

10. Industries in the Mediterranean Countries

Mild climate around the year brings little rain in summer and more rain in winter, characteristic of the mediterranean climate. They grow wheat in winter and grapes, orange and olives in summer. In Italy, rices are grown in areas accessible to irrigation. Rome and Napole are known for historical relics. Iberia peninsula is rich in oak trees, from which corks are made. Highlands occupying a majority of the peninsula are adequate to live stock industry-sheep and goat in particular. In recent years, manufacturing industry has advanced considerably.

2. THE ELEMENTARY-MIDDLE SCHOOL DEVELOPMENT PROJECT

The initial and major task assigned to the new KEDI at the time of its inception was a major and comprehensive reform known as the Elementary-Middle School Development Project (E-M Project). The purposes of this project were clearly stated in the proposal to the United States Agency for International Development for assistance and financial support. They are included in the mission statement and focus on: Korean ideals and objectives, revised educational content, a new and more efficient instructional system, and creation of a research and development center.

Utilizing this basic set of purposes, the FSU study team report and its recommendations, data from research studies by Korean educators, and perceptions of leading educational authorities of the nation, the KEDI administration and staff undertook the development of a set of specific objectives and an implementation plan to achieve these objectives. These objectives included the following:

1. To develop new curricula that reflect Korean national ideals and needs; a balance in terms of cognitive, moral, and effective learning outcomes; and modern knowledge and technological development and applications
2. To raise the achievement level of all children
3. To improve the achievement level of children in the higher learning thought processes (as reflected in Bloom's taxonomy)
4. To reduce regional gaps in achievement by equalizing the educational quality and educational opportunities of both rural and urban children
5. To provide added educational opportunity for all children, especially those in the middle school year groups

6. To improve the cost effectiveness of the educational system
7. To increase the accountability and credibility of the educational system in the general public in order to obtain greater support for the new educational system

A 1978 publication of KEDI reinforces this early statement of E-M Project goals. The statement reiterates these early goals in three dimensions:

STUDENT

. . . an increase in student achievement through a more effective instructional system that draws on up-to-date theories of learning and teaching

. . . a development of rational and creative thinking that will enable young people to cope with new problems

. . . a shift away from abstract learning with major reliance on the textbook to experiential learning relevant to current needs

. . . instruction tailored to individual needs and abilities to provide for meaningful learning and a sense of achievement

TEACHER

. . . an improvement of school management through the application of modern management techniques utilizing a systematic planning of activities and their evaluation on a periodical basis

. . . a reduction of teacher workloads that will permit greater attention to individualized instruction, research and inservice training, and improvement of teaching competences

NATION

. . . a decrease in regional disparity in terms of educational quality and educational opportunity

. . . an increase in the rate of return to the nation from the investment in its educational programs-a return that is measured by more effective outcomes of schooling

. . . a lowering of financial burdens on parents and an increase in the accountability and credibility of the educational system

Implementation of the E-M Project

With the goals of the E-M Project clearly identified, KEDI undertook the implementation of a carefully developed project plan which focused on: educational goals, a new instructional system, a revised curriculum and appropriate learning materials, a new school management system, instructional and educational radio and television, in-service and pre-service teacher training. Implicit in all of this was, of course, experimentation and demonstration of the effectiveness of the new system through field trials, a strong program of evaluation, and a plan for ultimate diffusion of the program on a nationwide basis.

Studies of Educational Goals. A study of educational goals was essential in the development of a new curriculum, learning materials, and the new instructional plan. Thus, it was early in KEDI's existence that goal studies were undertaken. These studies were an effort to identify and translate into an educational system the values of Korean society. KEDI appropriately began the study of educational goals with a seminar designed to involve a broad range on interested persons. Among other projects were studies of the historical foundations of the Charter of National Education, definitions of value and moral education, student attitudes toward national referents, teacher attitudes toward the national identity. In all of the efforts focusing on educational goals, KEDI involved a broad spectrum of Korean society including educational leaders from the various levels of education. The goals thus identified have been and continue to be the basis for curriculum development and

the development of teaching-learning materials.

The KEDI Educational System. The new educational system which evolved from the planning process and extensive field trials consists of four subsystems relating to: instruction, school management, instructional radio and television, and school evaluation.

The instructional system model is similar to other instructional system models found throughout the world. The model, designed to take into consideration individual needs and abilities and to focus on the academic progress of individual students, has five stages: (1) planning, (2) diagnosis, (3) teaching-learning, (4) extended learning, (5) evaluation. An important aspect of the system is that of mastery learning. Figure 1, taken from a 1978 publication of KEDI summarizes the major features of this instructional system.

The school management model, which draws heavily from the literature of management by objectives (MBO), has three components: planning, implementation, and evaluation. It is a comprehensive system with provisions to establish school goals and objectives, to set priorities on these objectives, to specify how and when they will be carried out, to determine the management plan (including grade level and combination of grade levels), and to determine how each objective is to be evaluated.

The instructional radio and television model has three major components: production of radio and television instructional and educational programs, transmission of programs to the schools and the general public throughout Korea, and evaluation of the quality and effectiveness of the programs. Initially, the primary purpose of KEDI's educational broadcasting system was to enhance instruction in the elementary and middle schools of Korea. Radio and television were to be *instructional* in use. The radio and/or television program was to be the primary teacher of certain content included in the individual program being broadcast. An instructional unit for a particular segment of schooling was to include in its design the utilization of radio and/or television

Figure 1. The major features of the new instructional system may be summarized as follows

Stages	Activities	Emphasis
Planning	Instructional planning by grade	Elimination of problems with class-centered (Self-Contained) instruction
	Planning for departmentalized teaching of arts and physical education	Elimination of ineffective instruction in arts and physical education subjects
Diagnosis	Identification of prereguistite learning deficiencies at the beginning of semester or unit	Determination of individual differences
	Provision of supplementary program for those with learning deficiencies	Reduction in individual differences
	Teaching of preview methods	Individualized preview
Teaching & learning	Objectives-based instruction	Clarification of objectives
	More opportunities for pupils' active participation in learning	Utilization of multiple instructional system
	Higher motivation and encouragement of learning based on first-hand experience	Autonomous learning habits Utilization of radio and TV programs
Extended teaching & learning	Formative testing to assess the learning progress of individual	Identification of individual learning deficiencies
	Supplementary program based on the formative test results	Prediction of instruction effectiveness and measures thereof
	Enrichment for those with accelerated attainment of objectives	Opportunity for the more giffed to advance
Evaluation	Summative evaluation upon completion of unit and semester	Determination of instructional effectiveness.
	Assessment of objective achievements.	Criterion-Referenced evaluation

at specific points and times as the primary provider of lesson content. The determination of the content to be provided via radio and television was to be decided in terms of the uniqueness of radio and television as a teaching method. The objectives and the instruction that could best be accomplished by television and/or radio were to be presented by television and/or radio. Similarly, the objectives and the instruction that could be best accomplished by the classroom teacher were to be presented by the teacher.

However, the failure of the T-COM technology made it impossible for KEDI to make any extensive use of radio and television in the instructional process as planned. Although some limited use of radio was possible using the facilities of the Korean Broadcasting System and although, in a few isolated instances, the use of portable classroom equipment made possible the use of videotape programs, the planned use of radio and television as an integral aspect of the educational process was not achieved. Curricular and teaching plans had to be modified to compensate for the absence of broadcast elements of the instructional process.

In spite of the failure of T-COM, KEDI continued the production of radio and television programs in the hope that they could be utilized at a future time when adequate transmission facilities became available. By the end of 1978 KEDI had produced 1,696 television programs and 13,469 radio programs. The development of a new land-based system has been planned, using the facilities of the Korean Broadcasting System. When this becomes operative, many of these programs already produced will be utilized for both instructional and educational purposes. However, it is important to point out that the original role planned for radio and television is changing. The shift appears to be in the direction of using radio and television for general education purposes and using the programs as an adjunct and supplement to the school curriculum rather than relating them to specific instructional objectives in the classroom.

The evaluation model has two components: intrinsic or formative evaluation and pay-off or summative evaluation. In order to evaluate the effectiveness of the new educational system evaluation procedures and instruments were developed. Included among the instruments were: the formative tests used on a regular basis to evaluate student progress and to determine the effectiveness of the instructional plan; summative tests that provided information to the teacher, student, and parent concerning the degree of *mastery* achieved in specified cognitive, affective, and psychomotor objectives; questionnaires to elicit opinions, evaluations, reactions, and comments from administrators, teachers, students, and parents relative to the effectiveness of the new educational system. In addition, field observations and interviews by KEDI staff were used to supplement data obtained by the use of the various evaluation instruments.

Curriculum. The curriculum for the elementary schools includes nine content areas: morals, Korean language, mathematics, science, social studies, music, fine arts, practical arts, and physical education. The curriculum for the middle schools includes these same nine content areas plus English and Korean history. An initial task of KEDI was to examine the current curriculum goals for each of these content areas and to develop specific objectives for each grade level for each subject field. In the initial revision of the curriculum KEDI considered many alternative approaches to revision. A decision was made to follow a revision plan that could be realistically managed, would receive widespread acceptance from college and university scholars, would be understood and accepted by teachers, and would include as many of the desired goals as possible. The curriculum thus revised was systematically tested in the field trials over a period of several years and modified on the basis of experience and evaluation.

Instructional Materials. During the period of almost six years during which the field testing of the new instructional system was carried out,

KEDI developed an extensive array of instructional materials. These included student guides, teacher guides, television programs, radio programs, and evaluation instruments. Based on the outcomes of the field trials, these materials were constantly reviewed and revised and made ready for eventual use in the national dissemination and implementation. Of course, all of these materials were supplementary to the textbooks already in use. In most instances, both student guides and teacher guides contained additional instructional material that was viewed as an important adjunct to the textbooks. A recent government decision has moved the responsibility for the planning and writing of textbooks from the Ministry of Education to KEDI. This new responsibility should make it possible for KEDI to develop a coordinated set of instructional materials matched to the instructional plan and the revised curriculum.

Teacher Training. KEDI early recognized the need for improvement of teacher education in Korea. In addition, it was clear that a comprehensive educational reform as envisioned in the E-M Project, would call for a heavy investment of time and resources for both in-service and pre-service teacher education that would be compatible with the new educational system. In addition to basic studies aimed at the general improvement of teacher education, KEDI focused its efforts on (1) the development of a program of in-service teacher education for those teachers involved in the field trials of the new system, (2) preliminary studies and activities related to a new pre-service teacher education program, (3) planning for a national pre-service and in-service teacher education program that would be necessary once the new system was established on a nationwide basis.

Obviously the major teacher training task in which KEDI was involved was that of preparing teachers for participation in the field trials-the small scale tryouts and the comprehensive demonstrations of the new educational system. In the undertaking of this task, KEDI staff developed a variety of teacher training materials including radio and television

programs, held teacher training conferences, and engaged in group and individual instruction in the demonstration schools. Figure 2 provides a summary of in-service teacher training activities covering the four-year period of the comprehensive demonstrations.

The Field Trials. An essential aspect of the E-M Project was field testing of the new educational system through a series of field trials including both small scale tryouts and large scale demonstrations in which it was possible to compare educational outcomes in the experimental schools with those in the control schools. These field tests were designed to test and verify the effectiveness of the total system and each of the components of the system. Initial field testing began in 1973 and continued until 1979 for the elementary school aspect of the E-M Project. Initial field testing of the middle school aspect of the project began in 1978 and still continues.

The four small scale tryouts involved either a single grade or two grades for a limited period of time. The emphasis of these small scale tryouts was on testing the feasibility of teacher guides, student workbooks instructional radio and television, student assessment instruments, and to a limited degree the management system and the evaluation design. The four comprehensive demonstrations were designed to test the effectiveness of the new educational system in a representative number of schools throughout the nation in large cities, small cities, and rural communities. In addition to testing the feasibility of the instructional system and the instructional materials, the comprehensive demonstrations were used to evaluate teacher training procedures and the total school management system.

The first small scale tryout involved 745 students in two grade levels in two elementary schools in Seoul. The final comprehensive demonstration involved 18 schools (one in each province and one each in Seoul and Pusan), plus 228 cooperating schools (schools not directly involved in the research study but voluntarily participating in the KEDI instructional

Figure 2.

	FIRST COMPREHENSIVE DEMONSTRATION	SECOND COMPREHENSIVE DEMONSTRATION	THIRD COMPREHENSIVE DEMONSTRATION	FOURTH COMPREHENSIVE DEMONSTRATION
Purpose	To become knowledgeable concerning the new KEDI educational system, skilled in its implementation, and aware of the nature of the comprehensive demonstration and its operation	(1) To develop understanding and knowledge concerning the new KEDI educational system (2) To acquire skill in the utilization of the instructional system and the school management system (3) To develop an understanding of the nature and operation of the comprehensive demonstrations and skill in their implementation (4) To become aware of the importance of educational innovations and to develop a readiness to accept them (5) To develop in teachers, administrators, supervisors, and other educational personnel a potential and a capacity for serving in leadership roles in introducing and implementing the new educational system on a nationwide basis		
Content	(1) Concerns and problems in Korean education; the nature of the new KEDI educational system (13 hours) (2) Methods of instruction in subject areas (17 hours)	(1) Concerns and problems in Korean education; the nature of the new KEDI educational system - - instruction and school management (30 hours) (2) Subject area curricula and teaching methodology - - curricula, instructional system, teaching methods (30 hours)	(1) The nature of the new KEDI educational system-instruction and school management (12 hours) (2) Subject area curricula and teaching methodology (12 hours)	(1) The nature of the new KEDI educational system-instruction and school management (6 hours) (2) Subject are curricula and teaching methodology (8 hours)
Method	(1) Three-day intensive seminar (2) Field supervision and consultation on group and/or individual basis (four occasions)	(1) Two two-day periods of intensive seminars (2) Field supervision and consultation on group and/or individual basis (four occasions)	(1) Two two-day periods of intensive seminars (2) Field supervision and consultation on group and/or individual basis (two occasions)	(1) One two-day period of intensive seminars (2) Field supervision and consultation on group and/or individual basis (two occasions)
Basic instructional materials	(1) Training textbook (2) Operational guide (3) Teacher guides (4) Student workbooks (5) Correspondence excerpts	(1) Training textbook (2) Operational guide (3) Teacher guides (4) Student workbooks (5) Field newsletters	(1) Training textbook (2) Operational guide (3) Teacher guides (4) Student workbooks (5) Field newsletters	(1) Training textbooks-Books I, II, III (2) Operational guide (3) Teacher guides (4) Student workbooks (5) Field newsletters

(1) Participants included teachers in demonstration schools, supervisors and administrators, and volunteers from cooperating and adjacent schools; (2) Selected KEDI professionals served as instructional staff; (3) Instruction occurred at each demonstration school. (4) Content, instructional materials, and methodology were modified constantly on basis of evaluation.

system and the use of KEDI instructional materials). This comprehensive demonstration, including experimental and cooperating schools, involved over 4,000 teachers and 237,000 students. Continuing field trials involve a number of selected middle schools as KEDI focuses its attention on the middle school segment of the E-M Project.

Outcomes of the E-M Project

The E-M Project is among the most comprehensive efforts at educational reform ever undertaken. It involved a systematic effort to develop: educational goals, a new and improved curriculum, appropriate and effective learning materials including radio and television, a new instructional system, a new school management system, an evaluation plan, and a system of field trials designed to assess the effectiveness of the entire project.

Below are summarized certain selected outcomes of this project on the basis of available evidence accumulated during the period from 1972-1979.

Student Achievement. Student achievement data collected during the comprehensive demonstrations indicate a higher level of academic achievement by students in the experimental schools than by their counterparts in the control schools. Test scores showed significantly higher achievement scores in all grade levels and in most subject fields. Further, a consistently higher percentage of students in the experimental schools achieved the *mastery level* than students in the control schools. An independent study by the Evaluation Committee of the New Educational System appointed by the Ministry of Education validated the KEDI data that pointed to higher educational achievement by the experimental school students. While not conclusive, KEDI data suggest that the new system is having some small but positive effect in improving the higher level thought processes. However, further studies are essential in this area of research.

Regional Educational Equality. One of the problems of concern to Korea was an evident inequality of educational achievement, educational quality, and educational opportunity between urban and rural areas. Obviously, the E-M Project could not be expected to bring about national change in a process that involved only a selected sample of schools throughout the nation. However, evidence points to the potential of the new educational system in achieving regional educational equality. Test data offer promise that the new educational system can be effective in reducing regional disparities. The newly developed instructional materials, curricula that are relevant to the needs of rural children, improved quality of teaching as a result of in-service training, and the future availability of radio and television educational programs - - all these point to an eventual system of education that will meet the needs of all children, both urban and rural.

Cost Effectiveness. The major problem in determining cost effectiveness of a new educational system is one of meaning and the acceptance of a viable definition. Answers are needed to a number of questions. What are reliable baseline costs against which the new educational system can be compared? How much better is the new system than the present system? How important to Korea and to Korea's future are the improvements achieved in the new system. These are not easy questions to answer. However, studies that have been made point to the fact that the cost of the new system, or possibly any new system, will be relatively high in the initial stages. New instructional materials, educational technology, a massive program of in-service teacher training, new schools to provide for educational opportunities for increased numbers of middle school age students - - all these add to the cost of education. At the same time, as larger numbers of students are involved in the new educational system, student unit costs decrease. This finding has been validated by studies of the E-M Project costs. While at this time it is not possible to come to any exact conclusions concerning the cost effec-

tiveness of the new educational system, one can reasonably assume on the basis of current evidence that the new system has an advantage over the current system in terms of cost effectiveness.

Increased Educational Opportunity. The achievement of this goal is dependent upon the new educational system being in operation on a nationwide basis over a period of years. However, one can make certain assumptions. With increased educational achievement on the part of elementary school children, it is likely that a larger number will gain increased benefits from learning and will enroll at higher school levels on completion of the elementary school. Further, once the planned use of radio and television becomes operative, educational opportunity will be extended to larger numbers of individuals at all age levels through informal and non-formal education offerings.

Accountability and Credibility of the Schools. While the achievement of this goal also requires an extended period of nationwide operation of the new educational system, there are some indicators that are useful. KEDI studies involving teachers, principals, supervisors, students, and parents indicate a favorable reaction to the new educational system, to its effectiveness with students, to improvements in teacher quality, and to the responsiveness of the system to individual student needs and national goals. Once the program of radio and television for educational purposes becomes operational, the visibility of the schools will become even greater and accountability requirements will increase.

In addition to these specific outcomes, a number of other findings of the E-M Project are interesting. There is general favorable reaction among all concerned-teachers, principals, supervisors, students, and parents-to the new system. More than 70 percent of the teachers rated as effective the teacher guides, the grade-centered management system, departmentalization, the unit plan, the lesson plan, and suggestions to teachers. Teachers and principals were in agreement that the new system increased self-directed learning. KEDI, in a 1978 publication, asserted

that the new system enabled teachers to devote themselves more fully to instructional planning and relevant studies, thus improving their teaching skills. Another statement in the same publication pointed out that 88 percent of the parents felt that students were more highly motivated in the new system.

It is important to mention that the study conducted by the Evaluation Committee of the New Educational System, a group appointed by the Ministry of Education, yielded generally favorable evaluations in all aspects of the E-M Project. At the same time, the Committee made a number of suggestions for continued improvement of the new educational system.

Concluding Statement

There is little question that KEDI, through the E-M project, has achieved remarkable success in the development of a model of educational reform for Korea. Clearly defined educational goals, a new curriculum and new and effective instructional materials, a new instructional system and school management system - - all these set the stage for a comprehensive reform effort. Data generated by KEDI and by an independent evaluation team support the effectiveness of the new system and suggest national implementation at the earliest feasible time.

KEDI has developed plans relating to national implementation including a new system of pre-service and in-service teacher education. The task of implementation, as visualized by KEDI and the Kroean government, will be assigned to the Ministry of Education. To KEDI is to be assigned the role of follow-up studies to determine the effectiveness of the implementation program and to suggest improvements.

However, KEDI will continue to have an important task in the completion of the E-M Project. Study and experimentation still continue in respect to the middle school aspect of the project. Additional tryouts and demonstrations are planned that should lead to the submission of a

second nationwide reform effort at the middle school level. Further, as facilities for the transmission of radio and television educational programs become available, KEDI will have an opportunity for extensive testing of the effectiveness of these media at both the elementary and middle school levels. It is conceivable that additional tasks in the program of educational reform will be assigned to KEDI and will include projects involving high school education and even post-secondary education.